



Battling Brown Patch

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John Wooden said it best when he said, "Failure to prepare is preparing to fail." The year 1999 was a rough year on many superintendents and their chemical budgets, but now it is time to look to the future. Results from the latest research may be all that is needed to battle brown patch when Mother Nature decides that the summer of 2000 will be the hottest ever.

Brown patch is a disease caused by the fungal pathogens *Rhizoctonia zeae* and *Rhizoctonia solani*. Symptoms of

brown patch include leaf blades that appear water soaked and dark. Eventually those blades dry up, wither and turn dark brown. During periods of high nighttime temperatures (>70° F) and very high humidity "smoke rings" may form. "Smoke rings" are actually very active mycelium growing at the outer edge of the diseased area. Although smoke rings are a very obvious sign of brown patch, they do not have to be present for the pathogen to be active.

Because brown patch can do

serious damage to turf, personnel at the TDDL have conducted an evaluation of chemicals used in its control. The fungicide trial was done on 2,500 ft² of colonial bentgrass, which had been established in 1997. The study area was maintained under golf course fairway management conditions. The plot was mowed three times a week at 0.50 inches, was irrigated 3 times weekly at 70 percent of the evapotranspiration rate, and had received approximately 3 lbs. N per 1,000 ft by August 11, 1999.



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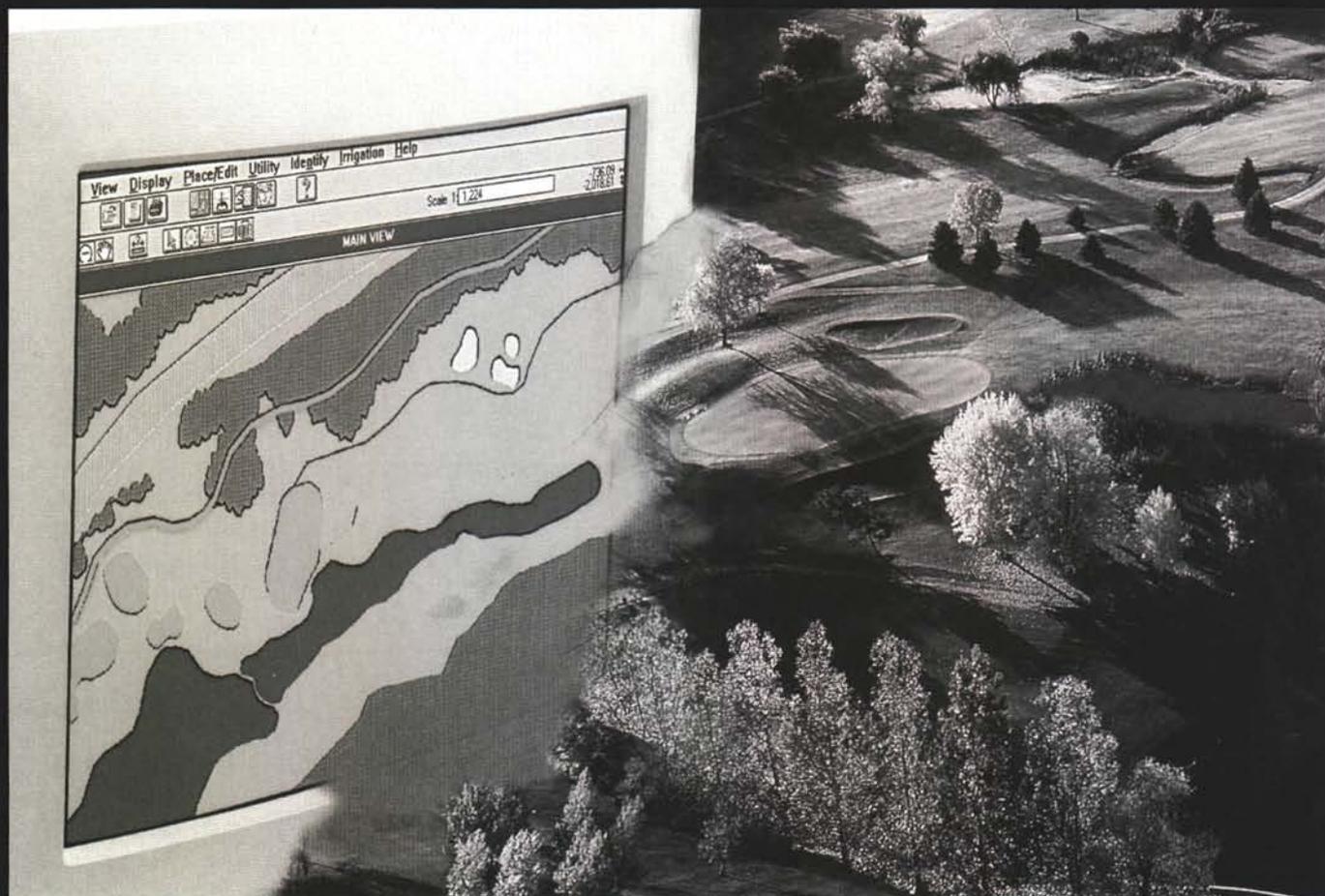
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The study consisted of one untreated control and 19 treatments. Individual 3 ft x 8 ft plots were arranged in a randomized complete block design with three replications. Treatments were applied with a CO₂ powered boom sprayer using XR Teejet 8005 VS nozzles at 30 psi, in water equivalent to 2 gal per 1,000 ft². All treatments were initiated on June 21, 1999 and continued at specified intervals.

Rhizoctonia zeae and *R. solani* can infect and cause damage to most cool and warm season grasses. Creeping, colonial, and velvet bentgrasses are all susceptible.

Kentucky bluegrass, perennial ryegrass, fine fescue and annual bluegrass are also susceptible. The pathogen is most severe on turf which has received high nitrogen treatments and when dew points are near 70° F.

High disease pressure at the end of June yielded the first results from the study. The plots were rated for percent infection on July 4, 1999. On July 13, 1999 the experimental area was inoculated with both species of *Rhizoctonia* to ensure the disease was present throughout the plots. Percent infection ratings were taken again on July 19, 1999 and July 29, 1999.

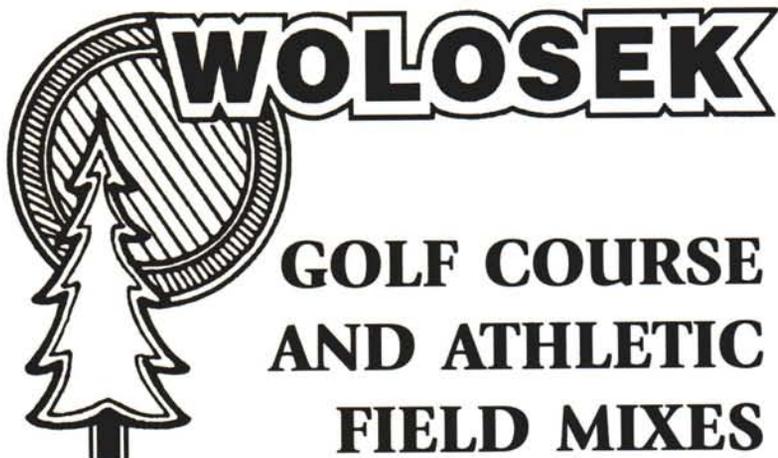
These ratings were subjected to statistical analysis to determine significant differences between treatments.

Table 1 lists all the treatments and their efficacy as observed by the TDDL. The first ten treatments are three-way reduced-rate mixtures. The reduced-rate treatments do not indicate the efficacy of those same chemicals when they are used at their labeled rates. Unlike previous years these combinations did not result in desirable control. The study indicated a significant amount of control with these mixtures, but none of them were as effective labeled

Table 1. Percent Brown Patch Infection

Trt#	Treatment	Form.	Rate	Rate Unit	Interval/ Timing	% Infection 7-4-99 AVG		% Infection 7-19-99 AVG		% Infection 7-29-99 AVG		% Infection 8-2-99 AVG	
1	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	15.0	BCD	13.3	DEF	26.7	CDE	0.0	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2									
2	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	5.0	CD	16.7	C-F	30.0	CDE	0.0	C
	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2									
	Bayleton	25 DF	0.11	oz/1000 ft2									
3	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	1.7	D	11.7	EFG	23.3	CDE	0.0	C
	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2									
	Banner Maxx	1.3 MC	0.22	fl oz/1000 ft2									
4	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	3.3	CD	15.0	DEF	26.7	CDE	1.7	C
	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2									
	Rubigan	1 SC	0.5	fl oz/1000 ft2									
5	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	3.3	CD	20.0	B-E	33.3	CD	0.0	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Bayleton	25 DF	0.11	oz/1000 ft2									
6	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	25.0	B	25.0	BCD	55.0	B	0.0	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Banner Maxx	1.3 MC	0.22	fl oz/1000 ft2									
7	Daconil Ultrex	82.5 WG	2.5	oz/1000 ft2	21 Day	11.7	BCD	28.3	BC	33.3	CD	0.0	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Rubigan	1 SC	0.5	fl oz/1000 ft2									
8	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2	21 Day	3.3	CD	13.3	DEF	28.3	CDE	5.0	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Bayleton	25 DF	0.11	oz/1000 ft2									
9	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2	21 Day	5.0	CD	16.7	C-F	21.7	CDE	1.7	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Banner Maxx	1.3 MC	0.22	fl oz/1000 ft2									
10	Chipco 26 GT	2 SC	2.0	fl oz/1000 ft2	21 Day	10.0	BCD	30.0	B	40.0	BC	1.7	C
	Fungo Flo	4.5 F	0.25	fl oz/1000 ft2									
	Rubigan	1 SC	0.5	fl oz/1000 ft2									
11	Heritage	50 WDG	0.2	oz/1000 ft2	14 Day	0.0	D	0.0	G	0.0	G	0.0	C
12	Heritage	50 WDG	0.4	oz/1000 ft2	28 Day	0.0	D	0.0	G	1.7	FG	0.0	C
13	Compass	50 WDG	0.15	oz/1000 ft2	21 Day	0.0	D	10.0	EFG	13.3	EFG	0.0	C
14	Compass	50 WDG	0.15	oz/1000 ft2	21 Day	0.0	D	5.0	FG	20.0	DEF	0.0	C
15	Banner Maxx	1.1 MC	1.0	fl oz/1000 ft2	21 Day	20.0	BC	20.0	B-E	33.3	CD	15.0	B
	Primo	1.0 EC	0.2	fl oz/1000 ft2									
	Banner Maxx	1.1 MC	1.0	fl oz/1000 ft2									
16	Daconil Ultrex	82.5 WG	3.8	oz/1000 ft2	14 Day	10.0	BCD	0.0	G	23.3	CDE	0.0	C
17	Prostar	70 WP	2.0	oz/1000 ft2	14 day	0.0	D	0.0	G	1.7	FG	0.0	C
18	Chipco 26 GT	2.0 SC	3.5	fl oz/1000 ft2	14 Day	10.0	BCD	10.0	EFG	18.3	D-G	3.3	C
19	3336 Flo	4.5 SC	2.0	fl oz/1000 ft2	14 day	8.3	BCD	10.0	EFG	20.0	DEF	3.3	C
20	Check					55.0	A	78.3	A	80.0	A	81.7	A
LSD (P=0.05)						16.76		5.41					

Means followed by same letter do not significantly differ (p=0.05, LSD)



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When looking at Table 1 a small letter may be observed after each of the percent infection ratings. The letter indicates treatments that statistically did not perform differently from each other. A rating followed by a letter is statistically the same as another rating followed by that same letter. Treatment number 20 is the check. A small "a" follows this rating. Since a small "a" follows none of the remaining treatments, it can be concluded that the check is significantly different from all the other treatments. Thus the treatments were all better than taking no control measures.

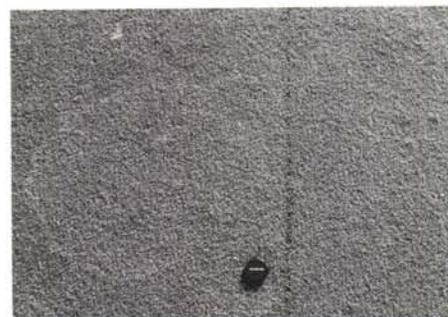
Along with percent infection ratings, samples were collected from each infection center and isolated onto PDA to determine the

pathogen present in each treatment. The TDDL personnel were looking for tolerance of the *Rhizoctonia* species to any of the treatments. Results from those isolations revealed that most of the disease pressure came from *Rhizoctonia solani*. *Rhizoctonia zaeae* was only isolated in one plot even though the entire experimental area had been inoculated with the fungus. Thus, no resistance to any treatment was observed.

Brown Patch may not be as threatening as pythium blight but it still can do damage when left unchecked. Hopefully the results of this study are all you need to show Mother Nature who is boss. Well, I know that won't happen but at least you will be waiting for it when she throws a curve next year. ♻



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Effects of a fungicide treatment on the development of brown patch.

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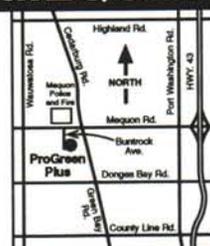
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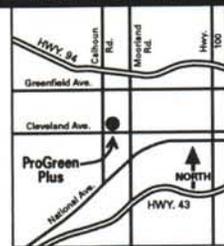
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Presidential Order Could Change Golf Course Turf

By Dr. John C. Stier, Department of Horticulture, University of Wisconsin-Madison

Last February I was contacted by a colleague who gave me a "sneak-peek" at a list of potential noxious weed species being developed by the Wisconsin DNR. Included on that list were plants with names like redtop, annual ryegrass, perennial ryegrass, tall fescue, and Kentucky bluegrass. When I contacted the person in charge at DNR to express my concerns, I was told this was only a proposed list: I was not supposed to see the list and I did not know what I was talking about. I was surprised when several weeks later I

received a letter from the same person stating "my name came up as a person who was quite knowledgeable about plants", and to please review the accompanying list of potentially noxious weed species. The list was a similar list to that which I had seen before although the ryegrasses had now been removed.

With the advent of the summer research season beginning I was unable to give the situation much more time. Later in the summer I received information that this activity went far beyond Wisconsin.

Indeed, the Wisconsin DNR was merely responding to a federal initiative. As I delved deeper into the situation I began to better understand the reasoning behind such an act. During late August I attended a meeting of the American Seed Trade Association in Chicago to discuss the effects of the Native Species Act on the seed industry, which had connotations for the green industry including golf courses.

Background. Of the 2,000 or so non-native species in the U.S., approximately 350 are considered



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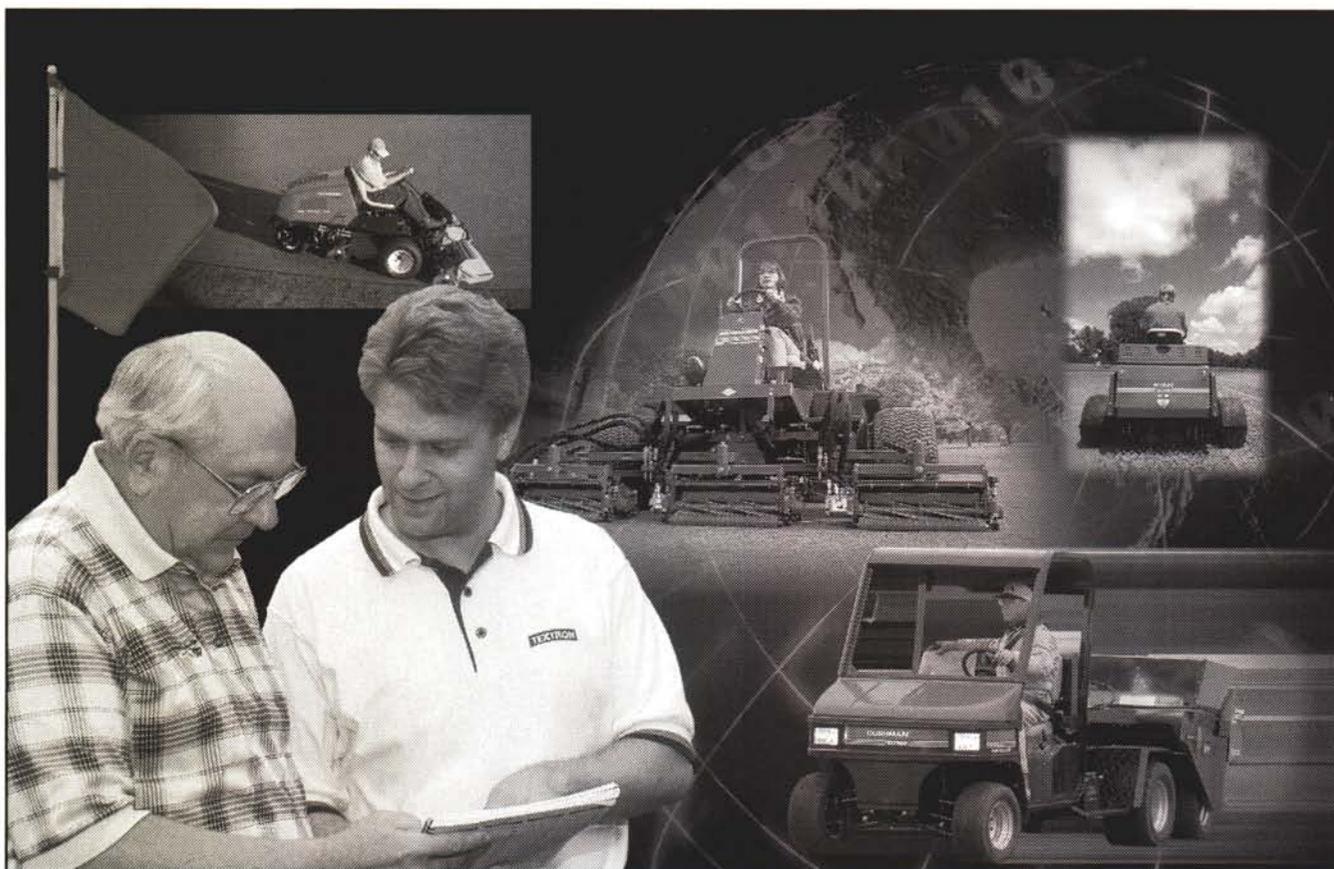
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serious and dangerous invaders. Some of the alien species may invade and outcompete native plant species, decreasing biodiversity. Plant and wildlife populations can be seriously altered as alien species take over ecosystems. A study released by Cornell University in June 1999 estimated the effects of alien plant species cost Americans \$138 billion annually.

What's going on? On 3 Feb. 1999 Clinton signed Executive Order 13112 which seeks to prevent the introduction of invasive species and provide for their control (plants and animals). The order mandated the establishment of a federal Invasive Species Council to be established by the Secretary of the Interior. A citizens advisory committee of private sector nominees will be formed to assist the Council. The spirit of the order is sound: "to prevent the introduction of invasive species and to provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause".

How will this affect me? Unfortunately the manner in which the situation is progressing may seriously impact the plant industry, including golf course superintendents. A federal invasive weed list won't likely be issued before summer 2000. In the absence of a federal list several existing lists, developed largely by native plant advocacy groups, are being referred to when plans are made for implementing the executive order. These lists from native species advocacy groups were often developed without

an appropriate peer-review or risk-benefit analysis. When placed on the internet, the lists can appear very official, a situation exacerbated when persons involved work for the federal government.

Politics roll on. By August 2000 the Council is to have developed and issued a National Invasive Species Management Plan. Currently the Plant Conservation Alliance/Alien Plant Working Group (PCA/APWG) is compiling information on species which various groups or individuals have identified as being invasive in natural areas. The mindset of the PCA/APWG is that even though turf, forage and ornamental plants have been used by the general public for decades or even centuries, they are invasive in either natural "or managed situations" and "will need to be restricted in the future". Given the existing lists, pressure from advocacy groups, and the short time-line for development of a federal list, there is good reason to believe certain economically and environmentally useful species will be placed on the federal invasive weed list. This could seriously impact the superintendent's ability to purchase seed for the golf course: if the federal government declares Kentucky bluegrass a noxious weed, its production and interstate transport will be curtailed or eliminated. It will also hamper or prevent new golf course development which needs approval from state and local agencies.

Addressing key issues can ensure this remains a beneficial executive order. A sound decision-making process must ensue in order for the order to be executed in a responsible manner. Input from the plant industry and university research and extension people should bring forth the following issues:

Item 1: The terms noxious, invasive, and alien are being used interchangeably by groups when assembling their lists of invasive weeds. The federal and state councils and advisory groups need to define and stick to the terminology.

Item 2: Too many groups are working unsupervised on their own lists and are placing them on the internet. Some groups misidentify species when the Latin and common names are listed, making it difficult to determine the exact species being listed (Table 1). These lists should not be used for decision-making without proper peer-review.

Item 3: When lists of undesirable plants are not properly developed, useful species (e.g., tall fescue) may be inadvertently placed on lists. While easy to get on a list, they are difficult to get off and will likely retain a stigma from the listing which may hurt their future use. The executive order specifies an "invasive species" as an "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health". Some of the species listed as "invasive" on the various lists promulgated by native species groups do not fit these terms, they sim-

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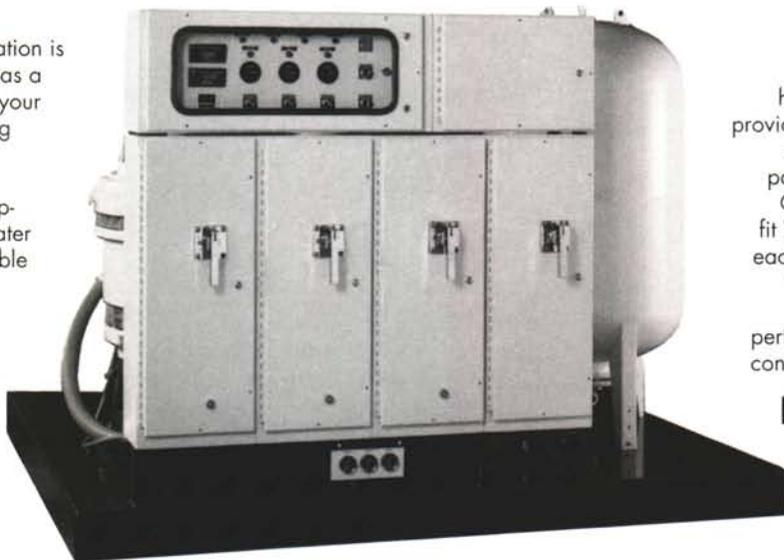
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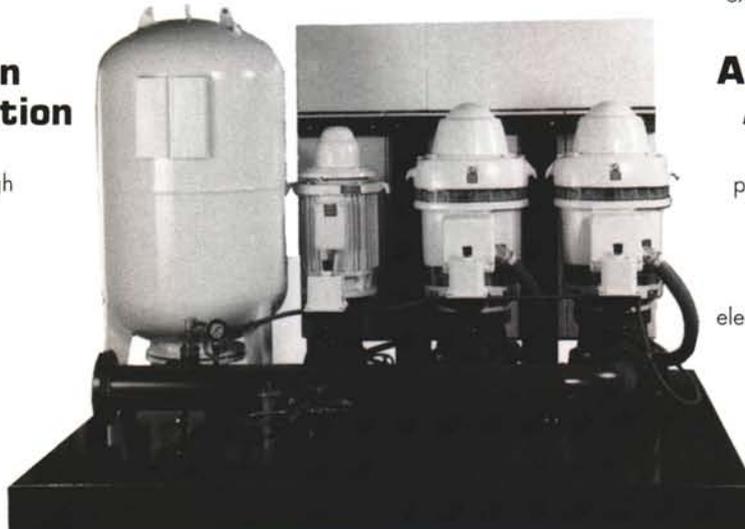
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