Musings About Turf Diseases During— or After—A Cool Wet Spring

By Dr. Gayle Worf
Extension Plant Pathologist
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It's been difficult for me to realize that we are no longer in a dry weather era. But after rains nearly every day for a month, and an accumulation of more than six inches above normal precipitation already for this year, I guess it's for real. Entomologists are predicting mosquitoes — and I'm predicting disease — no real risk in either one of those predictions, you'll probably agree.

Foliage diseases on trees and shrubs will be the highest in years, in my judgment. Look for an avalanche of anthracnose on ash, white oak and sycamore. Rust diseases will turn susceptible flowering crab and hawthorns yellow. Leaves will be falling off most crabs everywhere from scab by the Fourth of July. Many diseases we see only sporadically will be with us in 1990 — guaranteed — because we've already had the right kind of weather that these organisms, long dormant during the dry years, have been waiting for.

But what about turf diseases? The interesting thing about Wisconsin grasses is that they all thrive nicely under the cool, moist weather we've been having. A lot of turf has patched together areas that have been weak for several years. So it's a mixed bag. But my hunch is we'll see the effects of current weather patterns before the season is out. I'll offer you some thoughts about what might happen.

1. First, the obvious. **Leaf spot and melting out.** There's more leaf spot occurring on Kentucky bluegrass around the state than we've had in many years. We can see the value in "Helminthosporium" resistant bluegrass, or early season fungicide treatments, everywhere we look this spring. Old, susceptible turfs are going to be very thin before this spring's effects are over and the melting out phase has taken its toll, but the resistant cultivars have never looked better.

But why hasn't this affected our bentgrasses? Very few courses have treated so far this spring, according to comments I've received, and yet I've seen very little evidence of activity up to the present. The answer is probably the **temperature** we've been having. What's working on bluegrass is *Drechslera poae.* It's favored by temperatures about 55°-65°F., and it **quits** about 80°F. And this fungus does **not** attack our bentgrasses. There are a couple species of *Drechslera* which can attack bent, and which do well at these temperatures, but they're not common in Wisconsin, by my experience.

The most common "Helminthosporium" that I've seen on bentgrass here has been *Bipolaris sorokinianum.* Optimum temperatures are higher, more like 70°-90°F., so if the rains continue as the temperature goes up, consider yourself warned! This fungus, by the way, in contrast to the *Drechslera* species, works on a broad number of grasses, including Kentucky bluegrass.

If you have encountered a good case of "Helminth" this spring on your bentgrass, I wouldn't mind seeing a sample of it, for the sake of knowing which organism is involved.

2. **Patch diseases.** We again have a sizeable investment in evaluating springtime applications of fungicides for summer patch diseases on *Poa.* Plots are located at Pine Hills and Nakoma. The intent of early treatments, as you may know, is to get the fungicide in place at the time the fungus first becomes active. But *Magneporthe poae* is a warmer temperature fungus. It probably takes temperatures about 65°F, along with a wet spring, to get it going in time to rot out the roots and cause symptoms in August. So, based on the present theory, summer patch shouldn't be a problem this year. (I'm hedging on this one — I think that favorable June temperatures might do the job as well as May temperatures, so let's see what June brings.)

By contrast, the necrotic ring spot fungus is probably really enjoying the month of May! We've not seen much of that disease for the last few years, and I think the reason is the dry, but also the relatively warmer springs, that we've had. Some of those same bluegrass areas that look so good now because of Helminthosporium resistance may be showing dead rings and patches if the weather ever warms up and dries off a bit. And I'm thinking that our newer golf courses, particularly, may experience some take-all patch this summer and fall. That fungus likes this spring weather, too.

3. **"Odd-ball" diseases.** Unusual weather patterns like we've been having will spawn strange problems. We've already encountered a damaging level of foliage-attacking Fusarium of *Poa* this spring. In past years we had outbreaks of Ascochyta disease. If stripe smut fungus is still alive after the several unfavorable years, these weather patterns are ideal for it. So it should be another interesting year. And why not? Why should this year be different!?!

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RADIOS

By Monroe S. Miller

The flood of mail from numerous communication companies finally accomplished something — it got me to thinking about radios and their use on Wisconsin's golf courses.

We've got a couple of portable CBs that are rarely used, like once every couple of years. Then it's usually when we're working on an irrigation system problem. They are quite aggravating; we are in the middle of the city and there is chatter on every channel. Despite the fact that they are good radios built by a dependable company, the range of them is marginal. That may be because of the hills our golf course is built among.

At any rate, Rod Johnson and I came up with the following survey questions for this issue. The numbers may not add up like you'd expect because some golf courses have more than one kind. Rodney, Pat Zurawski and I asked these questions of 31 WGCSA members over the past couple of months.

1. Do you use radios on your golf course?
   - YES 18
   - NO 13
2. If yes, what kind?
   - CB 6
   - FM 11
   - Other 2
3. Number of radios:
   - Hand Held 65
   - Mounted 7
   - Others
     - pagers 2
     - cellular phones 2

Frankly, I was surprised by the numbers; I expected fewer would own them than do. However, quite a few of those who own radios confessed they used them less now than when they first bought them. Radios seemed used more in these situations, as determined during SURVEY questioning:

1. When the golf course superintendent has more than 18 holes to manage.
2. During tournament times.
3. In emergencies.
4. During irrigation system start up in the spring.
5. For security and patrol responsibilities.

The CBs in particular (as has been my own experience) were used less than anticipated. Most referred to the annoyance and irritation of their squawking, especially to people trying to enjoy a round of golf.

Some WGCSA members swear by their FM radios, however. One wondered aloud how he'd ever gotten along without them. Contrast that with the man who said, "I communicate face to face with my employees."

I thought possibly more people would have invested in pagers, at least until I heard a story about a WGCSA member and his pager. Seems as though he was talking to a member when the sweet, sexy voice of his wife came over the pager speaker, suggesting he come home. For the obvious reason.

I understand he doesn't use pagers anymore. I think most of us would have ditched the pager, too.

And then headed home! "Ten-four, good buddy."

Creeping Bentgrass Responses to Water Absorbing Polymers in Simulated Golf Greens

By Thomas R. Vlach

EDITOR'S NOTE: Tom has just completed his junior year in the Turf and Grounds Management Program. He has been awarded a Wisconsin Turfgrass Association scholarship for the 1990-91 school year.

Introduction

The 1990's are upon us, and the concern over water use is greater than ever. The marketing of soil polymers to increase the water holding capacity of the soil, as well as improving other aspects of turf, is increasing. The effects of these soil chemical conditioners on turf have not been well researched. The bulk of the research that has been done with these water absorbing polymers has not been tied to turf directly; rather, their effects on the transplanting of trees and shrubs, as well as agriculture crops have been studied rather extensively (e.g. Tatter, 1989; Baasiri, et. al. 1986. Wallace, 1987. Callaghan, et. al. 1988). It is from this type of research that inferences have been made regarding use for turf.

Literature Review

Claims made by soil polymer manufacturers include: 1) improved germination; 2) faster root development and more vigorous plant growth; 3) stronger and healthier roots; 4) reduced water consumption; 5) improved aeration and drainage; and 6) reduced fertilizer loss through leaching.

The results of what little research that has been done on turf by scientists independently of the companies that are developing these polymers have not been favorable. For example, one study examined the effects of several chemical soil conditioners on the moisture and nutrient retention capacities of sandy soils, and on the growth and quality of Manhattan perennial ryegrass (*Lolium perrenne* L.) and 'Penncross' creeping bentgrass *(Agrostis palustris* Huds.). From their study, the researchers concluded that "Under conditions of the studies, where sandy soils were subjected to compaction, chemical soil conditioners used did not beneficially affect soil physical properties, CEC, or turfgrass growth. In some instances the influence was detrimental to turfgrass quality and growth." (McGuire, et. al. 1978)

Objectives

Due to the lack of information on the influences of these polymers on turf I decided to research these water absorbing polymers for my Soils 299/Independent Study under the direction of Dr. Wayne R. Kussow. The objectives of this study were to examine the influences of water absorbing polymers on the establishment and growth of 'Penncross' creeping bentgrass in simulated putting greens. More specifically, we were interested in seeing if these polymers actually improve germination rates, produce more vigorous plant growth, promote stronger, healthier root systems and decrease the need for irrigation.

Methods

This study occurred under greenhouse conditions, with USGA-type greens constructed in a 6-inch diameter pipe. The rooting media was 12 inches of a 90:10 greens mix blended from Waupaca sand and reed sedge peat and amended with N, P, K and a micronutrient mixture. The greens were initially seeded at a one pound rate and then overseeded one month later at the one pound rate with 'Penncross' creeping bentgrass. Prior to the initial seeding, the top 3 inches of the greens mix was amended with 19-26-5 starter fertilizer at the rate of 1 lb. N/M. Polymers at the rate of 1 lb./100 ft^2 were then incorporated into this same soil volume. One green received no polymer and served as the control treatment in the study. The polymers tested were (1) Super Sorb F; (2) Terra Sorb HB; (3) StaWet; (4) Soil Moist and (5) Super Slurper. Super Sorb F, Terra Sorb and Soil Moist are polyacrilamide products. StaWet and Super Slurper are hydrolyzed, cross-linked starch polymers. A concern with these starch polymers is that they will break down quicker than the synthetic polyacrylamides. Actually, the lifetimes of none of these products are known with certainty.

Results and Discussion

The ability of polymers to improve the moisture relations of USGA sand-based greens depends on the moisture holding capacities and release characteristics of the polymers. Partial characterization of the water holding properties of the materials used in this study was accomplished by way of a hanging column apparatus that allowed determination of moisture retention at tensions ranging from 0 to 70 cm.

As shown in Table 1, the polymers retained considerably more water than the reed sedge peat but vary widely in this regard. The moisture retention figures for 40 cm. tension are particularly relevant because these approximate moisture held in the top few inches of a USGA-type green after drainage has ceased.

TABLE 1.
MOISTURE HOLDING AND RELEASE CHARACTERISTICS OF THE POLYMERS, SAND, PEAT AND THE 90:10 MIX EMPLOYED IN THIS STUDY.

Material	Moisture Content		Moisture released in going from 40 to 70 cm tension	
	0 cm. tension	40 cm. tension		
	Percent by weight		Percent	ML/g
Super Sorb F	17,135.0	16,156.0	3.82	6.17
Terra Sorb HB	36,278.0	32,028.0	4.60	14.73
StaWet	5.732.0	4,572.0	8.72	3.99
Soil Moist	1,564.0	1,338.0	12.00	1.61
Super Slurper	13,875.0	10,125.0	7.61	7.70
Waupaca Sand	26.1	22.5	82.30	0.18
Reed Sledge Peat	491.0	451.0	23.70	1.07
90:10 Mix	32.4	17.3	65.50	0.11

Perhaps the most significant data in Table 1 is the ML water released per gram of material when tension was increased from 40 to 70 cm. This is a measure of the amount of water released as the moisture in the sand-peat mix is reduced to a level where turfgrass begins to undergo strong moisture stress. As shown, there was considerable variation among the polymers in the amounts of moisture released over this tension change. For example, Terra Sorb HB released more than nine times as much water as did Soil Moist.

TABLE 2.
EFFECT OF POLYMERS ON BENTGRASS EMERGENCE AND STAND DENSITY.

Polymer	Plant Counts After 3 days	Average Density Rankings*
	#/green	
Super Sorb F	14	1.6
Terra Sorb	5	5.6
StaWet	23	2.3
Soil Moist	11	5.3
Super Slurper	9	3.4
None	11	2.9

*Rankings: 1 = Highest ranking, 6 = Lowest. Averages for 7 different dates.

To examine what effect the polymers had on germination and turf density, a seedling count was made shortly after germination and the greens were visually ranked for turf density throughout the semester. Seedling counts four days after seeding shows that, compared to the control treatment, Terra Sorb had an inhibitory effect (Table 2). Overseeding did not improve the turfgrass stand density in the Terra Sorb and Soil Moist greens. The bentgrass was observed to emerge, but the seedlings wilted and died after attaining a height of approximately one-half inch.

The average density rankings of the greens showed that only Super Sorb F maintained increased stand density throughout the study (Table 4). There was a significant drop off in stand density with the polymers Terra Sorb and Soil Moist. This observation agrees with the research of McGuire, Carrow, and Troll (1978) which showed that some polyacrylamides are detrimental to turfgrass growth.

To observe what effects these polymers had on turfgrass root development, cores were taken the full depth of the sand-peat mix at the end of the study and the soil washed away to expose the roots. There were significant differences among the root systems. (Figure 1 and Table 3)

TABLE 3.
EFFECTS OF POLYMERS ON RELATIVE ROOT WEIGHT AND DEPTH OF ROOTING.

Polymer	Rel. Root Weight*	Rooting Depth
		inches
Super Sorb F	1	14.0
Terra Sorb	6	19.5
StaWet	2	22.0
Soil Moist	5	14.5
Super Slurper	3	23.0
None	4	16.0

*Rankings: 1 = greatest weight, 6 = least.

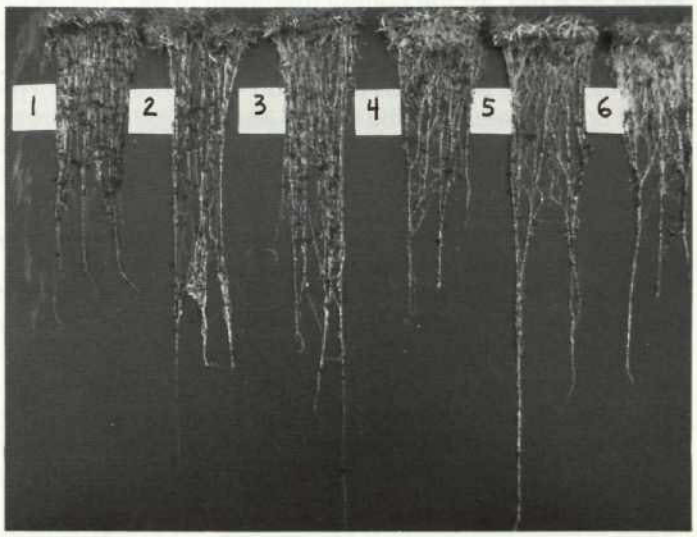

Fig. 1. Effects of the polymers on bentgrass root development. The treatments (L to R) are Super Sorb F, Terra Sorb HB, Sta Wet, Soil Moist, Super Slurper and the no-polymer control.

Greatest root growth occurred in the Super Sorb F treatment while depth of rooting was greatest in the StaWet and Super Slurper treatments. Compared to the control, Super Sorb F, StaWet and Super Slurper increased root weight and StaWet and Super Slurper enhanced rooting depth. Thus, from the standpoint of root development, the hydrolyzed starch polymers were more effective than the polyacrilamide polymers.

TABLE 4.
EFFECTS OF POLYMERS ON FERTILIZER N UTILIZATION

Polymer	Avg. Tissue N	N Uptake
	%	mg
Super Sorb F	4.71	64.7
Terra Sorb	4.14	59.3
StaWet	4.64	59.9
Soil Moist	4.46	35.0
Super Slurper	4.84	59.1
None	4.23	32.4

One claim made by soil polymer manufacturers is that these polymers improve drainage. The infiltration rates of each green were measured. The values ranged from approximately 41 to 59 inches/hr. The control green infiltration rate was 47.2 in./hr. Hence, polymers did not appear to greatly alter water infiltration. However, it needs to be noted that during the infiltration measurement Terra Sorb floated to the surface of the green and the Soil Moist column was considerably slower to drain than the other treatments.

The effects of the polymers on fertilizer N use were examined by analyzing for nitrogen in clippings removed over a three week period that began two weeks after application of 1 lb. N/M as Nutralene. All the polymers but Terra Sorb seemed to enhance tissue concentrations of N (Table 4). Since tissue N concentrations are affected by turfgrass growth rates as well as the amount of N absorbed, nitrogen uptake by the bentgrass was calculated. Over the three-week period, nitrogen uptake values ranged from a

low of 32.4 mg. for the control treatment to 64.7 mg. N for the Super Sorb F treatment (Table 3). The N uptake data suggest that, with the exception of Soil Moist, all of the polymers increased bentgrass utilization of the N applied. The low N uptake values for the control and the Soil Moist treatments were not due to low tissue N concentrations (Table 4), but to slow growth rates. These slow growth rates were attributed to a P-deficiency that developed in the Soil Moist and control treatments and was subsequently corrected by applying 0.38# P_2O_5/M as potassium phosphate.

Due to this P deficiency in the control treatment, it would be improper to suggest that several of the polymers directly influenced N uptake. Rather, these polymers somehow enhanced P uptake and, as a result, favored high N uptake.

TABLE 5.
EFFECTS OF POLYMERS ON BENTGRASS QUALITY RANKINGS AFTER 6 DAYS WITHOUT IRRIGATION.

Polymer	Quality Ranking
Super Sorb F	5
Terra Sorb	1
StaWet	2
Soil Moist	4
Super Slurper	3
None	6

*1 = best, 6 = worst.

To examine the effects of the polymers on moisture supply, the greens were left to dry out for six days and turfgrass conditions noted. Bentgrass in the control green grew very little and was almost completely brown after six days without irrigation. This is reflected in the turfgrass quality rankings shown in Table 5.

On March 31, all greens were topdressed with ¼-inch cutting height. A nitrogen deficiency immediately developed in the Super Slurper treatment. The deficiency persisted for five days, after which the grass slowly recovered its normal color. This sequence of events strongly suggests that topdressing of this green somehow led to denitrification loss of nitrogen.

Summary and Conclusions

Short-term effects of several water-absorbing polymers on bentgrass grown in simulated USGA-type greens were observed. No one polymer consistently improved grass germination, stand density, rooting and drought survival. Some actually exhibited detrimental effects.

Field research has yet to demonstrate the long-term effects of polymers on the quality of bentgrass putting greens at this time.

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Landscaper Finds New Love In Golf Course Construction

By Lori Ward Bocher

EDITOR'S NOTE: The author, a freelance writer located in New London, Wis., writes regularly for five agricultural publications, a turfgrass publication and "The Grass Roots". She graduated from the University of Wisconsin-Madison with a B.A. in journalism in 1977 and a B.S. in dairy science in 1981. She currently is vice president of WALSAA — the Wisconsin Agricultural and Life Sciences Alumni Association.

Born and raised on a dairy farm, Ms. Bocher was an associate editor for a national dairy magazine for seven years before moving to New London with her husband, pastor of the First Congregational United Church of Christ.

"It's been kind of a dream come true for me," Lee Bruce says of his landscaping firm's growing business in golf course construction. "I have truly found a love in that end of our business, spending about 95 percent of my time in it. I genuinely enjoy not only the projects we're doing, but also the friends that I've established through the years."

Lee Bruce is president of The Bruce Company of Middleton. One of the 10 largest landscape contracting firms in the U.S., its sales reached over $13 million in 1989.

Residential and commercial landscape contracting is the company's largest enterprise. The company also has a retail store, a landscape management service and its own nursery and sod farm. But the fastest rising star in the company is golf course construction, which represented 18 percent of the business in 1989 and is expected to exceed 25 percent in 1990.

Bruce has been in the landscaping business ever since he was an 11-year-old boy mowing lawns and plowing gardens. He knows the business from the ground up. So what makes him so excited about his journey into the world of golf courses?

"Generally, you're working with people who are happy and enthusiastic about what they're doing," he says. "They're excited about the outcome of each project. With landscaping, so often people are doing what has to be done to meet an ordinance. It just doesn't have the same tone."

Bruce uses his enthusiasm, and the fact that his company is primarily a landscaping firm, as selling points when negotiating for golf course jobs. "We tell them that we're doing what we love to do — that we were and are in business without taking golf course projects," he says.

"We want to be in golf course construction because we think it's fun to be here," he continues. "So far, we've gotten most of our work either through the architects that we've developed a relationship with or through referrals from other clients. It's a great industry, and we're tickled to be involved in it."

How did The Bruce Company get into golf course construction? They had tried for many years, but couldn't get their foot in the door because they had no experience. Then, in the late 1970's, the right opportunity came along.

"Things were very, very slow here in the Midwest at that time," Bruce recalls. "I had a friend from Denver who had the opportunity to bid on the second nine holes at the Copper Mountain Ski Resort (Copper Mountain, Colo.). But he couldn't get the bonding. So he called to ask if I would consider working with him. I suggested that we would be happy to bid the job and sublet parts of it back to him. So that's what we did."

With his friend's background in architecture and irrigation, and The Bruce Company's landscaping experience, they were able to qualify for the job.

For the company's second golf course job, they purposely underbid an 18-hole course in Garland, Texas, so that they would have 27 holes under their belt, thus making them eligible to bid for more jobs. "That course is now the Number 1 rated public golf course in the state of Texas," Bruce points out.

To date, they have completed 23 new courses and more than 100 remodeling jobs. Ironically, they were in the business for eight years before they had a job within 500 miles of home — Palatine, Ill. Their biggest project was the Eagle's Nest Golf Course in Silverthorne, Colo., which carried a $4 million price tag in the mid 1980's. At present, they have two new projects and three remodeling jobs under construction.

Here in Wisconsin, The Bruce Company has had only two new construction projects — the University of Wisconsin Golf Course near Madison and the Lee Travino course in Lake Geneva. At present, the company also is constructing an 18-hole course nearby in Rockford, Ill. — the Norris A. Aldeen Golf Course.

Three of their major remodeling projects in Wisconsin were at the Butte des Morts Golf Course, a Waukesha County golf course and Blackhawk Country Club in Madison.

At the University of Wisconsin course, The Bruce Company did the

mass earth moving only and completed its share of the work in the fall of 1989. The course is expected to be completed by this fall.

What was special about that job? "Probably the fact that Robert Trent Jones, Jr., is the architect," Bruce replies. "We did more interesting mass earth work on that project than anything we had been involved with previously. He was extremely innovative in his use of earth moving."

At the Lee Travino course in Lake Geneva, The Bruce Company's involvement is just the opposite; it did none of the mass earth moving but is doing all of the shaping and finishing work. "We're hoping for a September completion," Bruce says.

The Lee Travino course is one of three being constructed at the Geneva National. The other two are designed by Arnold Palmer and Gary Player. "Working with the celebrities is an experience onto itself," Bruce says. "Probably the most interesting aspect of this project is the people we're working with and their outlooks on the game of golf in general."

He continues, "As far as the course is concerned, we've got an extremely nice site and there is a great deal of elevation change as well as water on the site. It's one of the most challenging courses that we've worked on."

The Geneva National is just one example of the growing popularity of golf. "Almost everywhere, people say there is a shortage of facilities," Bruce points out. "There are obviously a great number of new people getting into the game."

To date, Lee Bruce has *not* been one of those converts to the game of golf. "So far, I've been able to work around it," he says. "But I'm also thinking seriously about getting involved in the game. You're never too old to learn, so I still qualify."

Don't miss the September meeting at Cedar Creek — DANNY QUAST will talk about the 1990 U.S. Open.

SUMMER SCHOOL

By Monroe S. Miller

Oh. So you figured that since you've finally gotten all of your high school and college student employees on the golf course, school must be out.

Well, it is. For them. But if you're a WGCSA member, it's summer school for you. So clear your desk and your mind and take this summer school exam.

P.S. Be sure to read Bill Sell's letter elsewhere in *The Grass Roots.* It clarifies (and corrects) one of the last issue's final exam questions (#4). Thanks to Prof Sell!

1. What Wisconsin golf course was played by an American president while he was still in office. Who was that president?
2. Who received the first research grant from the O.J. NOER Research Foundation?
3. What Wisconsin golf course hosted the first GMO?
4. What Wisconsin golf course is listed on the National Park Service "List of Historic Places in America"?
5. Name the Wisconsin golf course built on land held by a former Wisconsin governor. Here's a clue: the current clubhouse sits where the governor had a hotel and guest lodge.

ANSWERS

1. La Crosse Country Club was played by President Theodore Roosevelt during one of his fishing trips to Wisconsin. T.R., a great naturalist and outdoorsman, loved Wisconsin's Brule River. GCSAA founding member Harry Hanson caddied for the president during that round of golf.
2. Dr. James R. Love. It was O.J.'s wish that the first grant would be given to a faculty member of his alma mater, the University of Wisconsin-Madison.
3. North Shore Country Club in Mequon. The first two GMOs were at NSCC, in 1968 and 1969.
4. Blackhawk Country Club was so honored in 1979 because of the historic Indian effigy and burial mounds located on the golf course.
5. Koshkonong Mounds Country Club was constructed on land owned by Wisconsin governor W.D. Hoard of Fort Atkinson. The club was the site of the May 1990 WGCSA monthly meeting.

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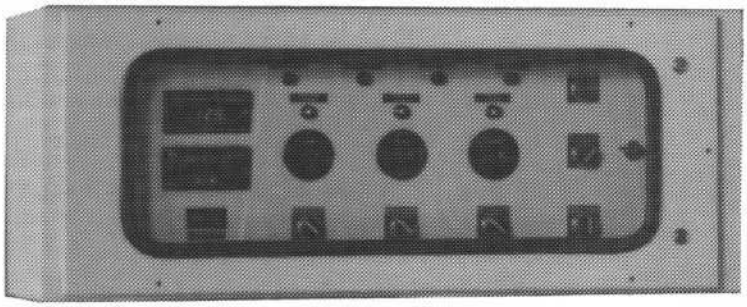

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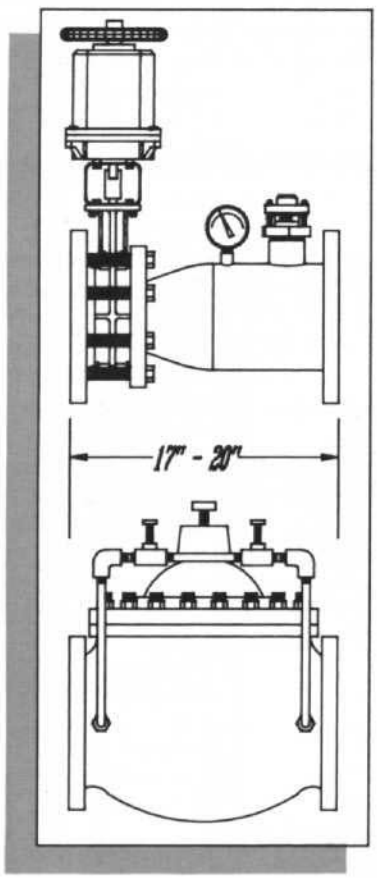

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