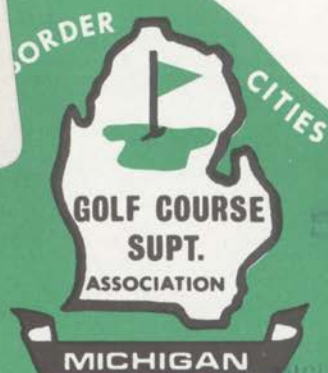


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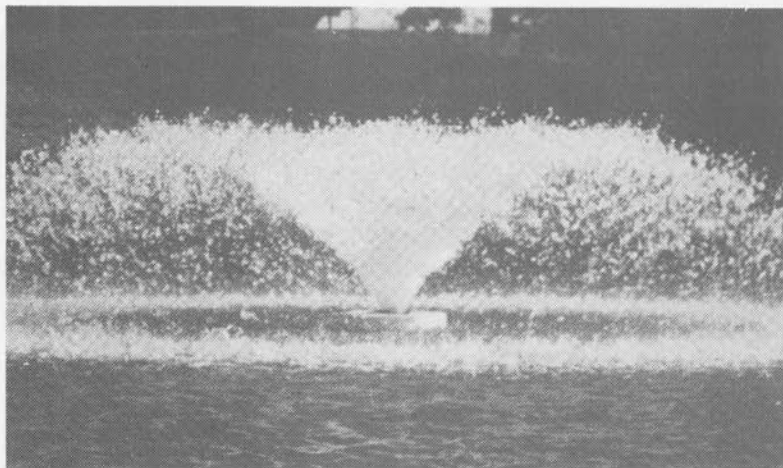
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## The following letter was received from the Michigan Department of Agriculture on March 23, 1979

On March 23, we received this letter from the Michigan Department of Agriculture.

The Michigan Department of Agriculture has received official notice from EPA that the registrations of 2,4,5-T and Silvex for all uses except on rangeland and rice were suspended as of February 28, 1979.

Specifically, suspended uses of 2,4,5-T are applications for brush control in forests, right of ways, and pastures. Suspended uses of Silvex are in forests, right of ways, pastures,

home and gardens, turf and aquatic weed control/ditch bank applications. This means all products containing 2,4,5-T or Silvex *may not be sold or used* in Michigan until EPA completes certain procedural steps in the cancellation procedures and issues a final order.

Retailers are being asked to voluntarily remove these products from sale. Recall will not be considered until the issue has run its course through hearings and such legal actions as may be instituted.

### GCSAA joins chemical industry in questioning EPA's propriety of banning 2,4,5-T and Silvex

Through GCSAA's Governmental Relations Committee, chaired by Director Richard H. Eichner, the Association has joined the chemical industry in questioning EPA's sudden banning of 2-4-5-T and Silvex. An article authored by Eichner on this controversial subject is in the May Issue of GOLF COURSE MANAGEMENT.

There may be many items that will

need the support of not only this Governmental Relations Committee, but will need support from each of you out in the field. This information on READY RESPONSE should be retained so that you may be able to write your U.S. Senator or U.S. member of the House of Representatives. It is almost certain that we may expect many changes in energy in the near future.

## An open letter to agriculture from the Dow Chemical Company

The Environmental Protection Agency announced on March 1 an emergency suspension of the herbicides 2,4,5-T and Silvex on the grounds that they posed an "imminent hazard to health and the environment." The basis for this decision was "new evidence" brought forth in a study of miscarriages in the Alsea, Oregon area.

The Dow Chemical Company has strongly opposed this "emergency suspension" for two major reasons.

First, we totally disagree with EPA findings that these chemicals are a hazard to human health or the environment; second, the arbitrary and capricious manner in which this emergency action was taken is contrary to EPA's own scientific review process (RPAR). Dow has sought injunctive relief in the courts to nullify the emergency suspension and appealed EPA's findings through the Agency's own system. At

Continued on next page

### Open letter cont.

this time we are awaiting hearings in both areas. We intend to fight for 2,4,5-T and Silvex because we feel both are safe products and that EPA has overstepped its authority and forgotten its responsibility to the public.

On the first statement - that 2,4,5-T is a safe product - we stand firm. It has been used for over thirty years, and over 40,000 studies and technical reports testify to its safety. In this period, and throughout these reports, there has never been a single documented case of human injury related to the normal agricultural use of 2,4,5-T. The Alsea, Oregon "evidence" to which EPA points with such a damning finger consists almost entirely of a seriously flawed study that attempts unsuccessfully to associate various miscarriages with the spraying of 2,4,5-T in neighboring forests. The data have been so badly mishandled and misinterpreted as to render the entire study worthless. Valuable data were ignored, usable data invalidated through poor gathering techniques and some data manipulated to apparently reach preconceived conclusions. When subjected to close scientific scrutiny, the Alsea, Oregon study is clearly proven to be invalid.

This study is also at odds with all previous studies of possible association between herbicide spraying and reproductive wastage, including

specifically, the recent report of Bisanti et al., *Experience of The Accident of Seveso* (Italy). This incident in 1976 released quantities of TCDD (the trace contaminant in 2,4,5-T) millions of times that encountered in normal agricultural use and the population of the village was not evacuated for several days. There were 187 cases of chloracne reported, but birth defects were "...less than expected in a well-controlled 'norma' population. . .spontaneous abortions showed statistically non-significant variations. . ." In summary, the report concluded "...the data do not seem to indicate that any major event has yet happened in the field of birth defects, abortions, births and deaths."

We are joined in our court battle by other concerned groups: The American Farm Bureau Federation; Western Timber Association; National ARBORISTS Association; Asplundh Tree Expert Company; Chevron Chemical Company; Vertec, Inc.; National Railroad Contractors Association; National Agriculture Aviation Association; Bartlett Tree Company; the Davey Tree Expert Company; Southern Oregon Resources Alliance; Oregon Women for Timber; Industrial Forestry Association; United States Steel Corporation; National Cattlemen's Association; Northern Michigan Electric Cooperative; Michigan Electric Cooperative Association; The Andersons; Associa-

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### Open letter cont.

tion of Illinois Electric Cooperatives; and Kentucky Association of Electric Cooperatives, Inc. They use the product, they know it's safe, and they know it would have been proven so through EPA's own scientific review process. They also recognize the significance of the EPA action beyond just the simple banning of a chemical product.

We are not going to speculate on the motives behind EPA's abrupt suspension. Perhaps they will be revealed in court hearings. We do want to point out to American Agriculture that if EPA can do this to a product with a record of 30 years of safe use, there is no fertilizer or pesticide which can be successfully defended.

All we ask is for those in charge of EPA to accept the decisions of their Agency's own scientific review process, as we in industry are more than willing to do, and act as a responsible

regulatory force. The American public must force EPA to accept this responsibility.

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# Don't give your grass a "Nervous Breakdown"

## Stress management of turfgrass

by John R. Hall, III, Extension Specialist, Turf  
Virginia Polytechnic Institute and State University

### PART 1 (to be concluded next month)

The topic of this presentation is budgeting stresses. It is not about preventative management, in terms of how to do it. It is about the philosophy of preventative management. This philosophy is one that we try to teach our professional turfgrass managers in the transition zone where it is extremely difficult to grow a quality cool-season turf. Some transition zone summers are strictly for bermudagrass. The humidity gets high, disease pressures are great, and the stress on the grass plant is often intolerable. If the plants do not die by being overwhelmed by total stress they get into a situation where they are predisposed to attack by diseases and other problems, that under normal conditions would have only a minor influence on the grass.

When we talk about preventative management we need to think about budgeting stresses, both stresses that we create on the grass and stresses that the climate creates. We need to look at budgeting stresses on the turf plant as we might look at budgeting our money. Think of the turf plant as really having a bank. That may oversimplify it a bit, but we do think in

terms of stored carbohydrates, proteins, etc. And, note the importance of having a lot of stored food reserves in that plant for it to call upon. For us, it is important to be able to go back to the bank to get more money, but for the plant it is necessary that it be able, in many instances, to call on the food reserves, and other materials in the plant for recuperation. It's easy for us to understand the idea of total stress, for as you know we can push ourselves at the job and with family and the community only so far. We all have a breaking point, and we may push ourselves to it. The plants that we are managing all have breaking points too. We need to keep this in mind as we are managing them. In my opinion there is a limit to the total stresses that the plant can bear just as there is a limit to the total stresses that we bear in our day to day life. But, remember that you and I are flexible. We realize if we are getting a lot of job pressure, that we need to release the pressure somewhere else. Sometimes we need to take off a little bit early or maybe we need to take a 3 day vacation. Of course, our plants

Continued on page 10

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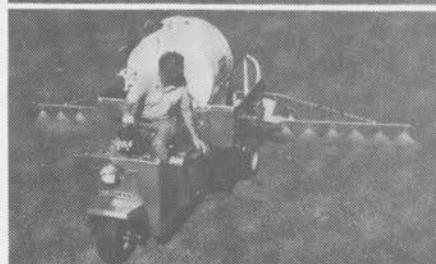
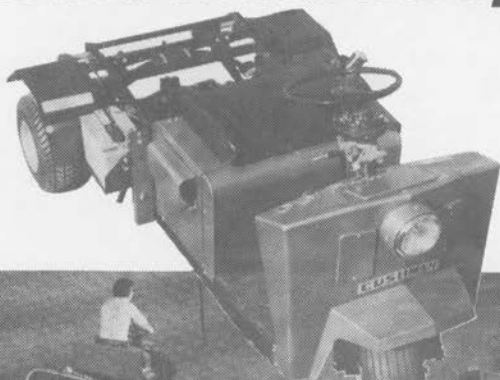
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## Stress management cont.

cannot do that. We need to think in this way in order to be aware of what we are doing and what "mother nature" is doing to the plant in creating stress. So, as a professional turfgrass manager one needs to be aware of some of the things we do in management that creates stress and some of the things that mother nature does that creates stress on the grass plant.

A professional turfgrass manager, has control over many management factors that create stress and he can alter these in his program to either increase or decrease stress as he sees fit. Sometimes the stresses are created not as we see fit, but as the people who provide the dollars see fit. We know that mowing frequency, mowing height, the type of mower, sharpness of the blade are all going to have a strong influence on the total stresses on the grass plant. We know that our irrigation practices can increase or decrease stress and that our timing on fertilization and the amount and type of fertilizer that we use, can have an impact. Such practices are either going to increase or decrease the stress on the grass plant. I don't see any situation where management practices maintain stress at a constant level for any period of time. These management factors vary from day to day along with the microclimate, as you well know; thus stresses fluctuate. Cultivation practices such as aeration

and topdressing, dethatching and pesticides that one uses influences plant stress. We need to be aware that some factors are more stress creating than others, and we need to know just what these are.

Hardins Law says that "*There Is No Single Effect*" and that is a point I would like to get across in setting up a preventative maintenance program. If you alter any one of the management factors that I have mentioned here you are influencing the total plant stress. In other words, one cannot alter any management factor, however minor, without altering the level of stress the plant is experiencing.

Let us take each of these factors into consideration one at a time. With mowing we know that the lower the mowing height the more total stress we place on the grass plant. With a lower mowing height we have a reduced root system and more plants per unit area. This greater number of plants competes more for nutrients and water. The more plants per unit area, the less healthy the individual plants are. The more frequently we mow, the more stress we create on the grass plant. So as we increase the stress factors with regard to mowing, we need to look at the other parts of the management program to reduce total stress. If you are in a very tight budget situation with regard to stresses where are you going to alter the management program to reduce the

Continued on page 13



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### Stress management cont.

stresses that have been created by mowing?

The type of mower used and the sharpness of the mower are an important factor in creating stresses on the grass plant. Almost all professional groundsman have observed the relationship between mowing height and the invasion of weeds. I have already mentioned that lower mowing heights do increase stress on the plant, and the lower cutting height has an additional side effect of increasing weed competition. Not only may the weeds themselves create more stress, but the fact that you have to apply DSMA or some other herbicide in June certainly is important in creating increased stress on the grass plant.

Consequently, when the greens committee comes to the superintendent and says - we want the fairways at 5/8" and that is the way it is, the superintendent needs to inform the committee of the increased maintenance

costs associated with the increase in the stress level. Thus, one may be forced to go above the maximum level of stress that the turf can tolerate and it is likely that he may lose some grass in July or August. Obviously mowing frequency and quality is important. Sharp mowers are very important. Every time grass is mowed with a dull mower, turf is torn. This is equivalent to someone coming up to you every morning as you walk into your office and hitting you on the back of the head with a baseball bat. Do not think for a minute that a dull mower doesn't make a difference to the turfgrass plant. The plant has to recover from that wound in the same way that you have to recover from a wound. To recover from a wound your body has to secrete wound hormones and get involved in producing compounds that are not a normal part of your daily life. The turfgrass plant has to do the same thing. It begins to

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### Stress management cont.

use carbohydrates for the production of wound hormones that it does not normally need to produce. The plant perhaps would have used that molecule for roots, rhizomes or leaf tissue development. Be constantly aware that a dull mower can increase stress on the grass plant.

Irrigation frequency, amount and timing plays a role in plant stress. We killed more golf greens in Virginia in 1977 with improper irrigation than through any other management factor.

Superintendents said that they were syringing, when in fact, they were not syringing, but were irrigating when it was 90 degrees F. The automatic irrigation systems are wonderful if used properly. It is common to see the yellowing of the turf that we associate with overwatering. Overwatering creates stress on the grass in that it predisposes the plant to susceptibility to Pythium, Rhizoctonia and other warm weather diseases. It is important for professional turfgrass managers to be aware of what the rooting situation is on all the greens. If we probe some portions of the rooting media with a probe, we may find layering. No matter what the turf manager does with irrigation he must be aware of what areas on the course are most likely to create problems. Soil layering creates a false water table where the water moves poorly. Once the water stops moving

Continued on next page



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## Stress management cont.

you get a bath tub effect and an anaerobic situation. The accumulated water has a great heat absorbing potential, and all of a sudden there is the potential to heat the crown of the bentgrass plant to 115 to 120 degrees or higher. Because of the tremendous heat absorption potential of water the plant begins to show the effects of excessive moisture and heat. The grass begins to die back from the tip and the death process begins.

This excessive moisture buildup in the presence of 90 degree weather is what kills a lot of greens in Virginia. The superintendent must always be aware of what kind of thatch layer is present. Depending on the soil type and on thatch buildup, syringing should vary from green to green. Obviously on a green with an excessive thatch layer one cannot afford - when temperatures are 90 degrees and 95 degrees during the day - to wet the thatch layer to the point where it's going to remain excessively wet for 2 or 3 hours during mid-day. If one is not careful with syringing it is easily possible to create sun scald situations. We know that proteins precipitate out of the plant protoplasm at about 125 degrees F to 135 degrees F and these kinds of temperatures are easily obtainable when thatch is loaded with water.

We can do a great deal in reducing stress on the grass plant by cooling the tissue through the process of water evaporation if syringing is done properly. For every gram of water that is turned from liquid to vapor by the energy of the sun, approximately 540 calories of heat is dissipated. So the plant system dissipates energy by allowing water to change from liquid to vapor, and thus excessive heating of grass plants is avoided. Heat dissipation by evaporation is really the theory behind syringing. Syringing, theoretically and practically, is the

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### Stress management cont.

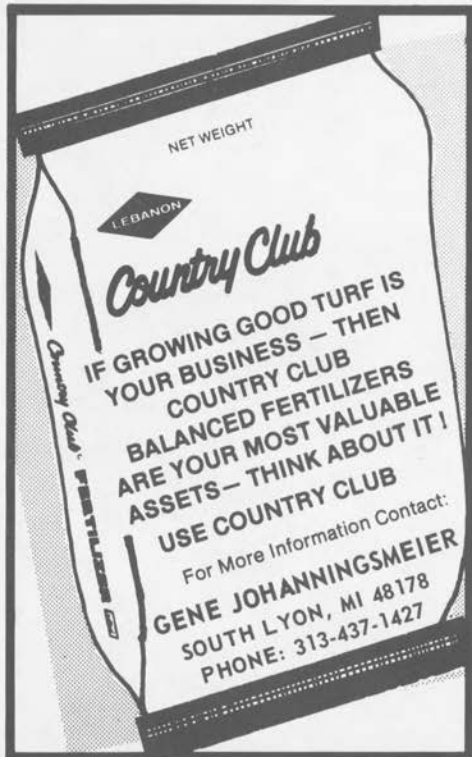
process of misting the grass plants. Obviously, most of our irrigation systems are not designed to mist the turf.

In golf green maintenance the superintendent needs to be aware of what kind of soil mixtures are present and what areas are going to need to be spot aerified, or require extra wetting agent to keep water moving through the green mixture. On some of our sand-peat greens we are observing spotty water penetration occurring in areas where the sands have developed organic, hydrophobic layers. These areas allow absolutely no water penetration once they are allowed to dry. A topnotch superintendent needs to know exactly what mixture he has and know what areas are going to need syringing, extra aeration or extra topdressing, etc. Greens should be mapped to locate these trouble spots in case the superintendent is absent.

Obviously, when we talk about water, the selection of varieties is important in decreasing total stress. In situations where moisture is going to be limiting perhaps bermudagrass is a reasonable choice. If the location is too far north then selection of Kentucky bluegrass varieties that have drought tolerance is important. In our work in the Mid-Atlantic transition zone, Vantage, Georgetown and Merion have exhibited good drought tolerance. Poor drought tolerance has been exhibited by Pennstar, Fylking, Bonnieblue, Nuggett, Majestic, Ram No. 2 and Warren's A-34. Where the goal is to minimize water stress, variety selection for drought tolerance is essential.

With fertilization stress factors it is important to be aware that the amount and type of fertilizer used can increase or decrease total stress. In Virginia and the climatic transition zone, we strongly recommend late fall fertilization. I will not say that it

Continued on next page



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## **Stress management cont.**

will definitely work for you. I would just present it to you as a philosophy of fertilization that might reduce total stress on your turfgrass plants.

In the plant system we basically have two metabolic systems. Photosynthesis is the process whereby the plant produces food in the presence of chlorophyll, light, carbon dioxide and water. The other system is called respiration - this is where the plant utilized the energy produced in photosynthesis. The interesting thing about the two systems is that the light reaction of photosynthesis is relatively temperature insensitive. In the bluegrass plant this process occurs almost as efficiently at 35 degrees as it does at 80 degrees F. However, when it is hot the plant burns up more food and can, in fact, utilize food at a faster rate than it can be produced in photosynthesis. The question that we ask is; Why push bluegrass to grow when respiration is maximum? Fertilizing in hot weather is like putting 10 dollars in a checking account and writing a check for fifteen. You can't do it forever. Our theory of late fall fertilization hinges around fertilizing the grass in the late fall of the year, when respiration is minimum and thereby forcing the foods to go into reserve instead of into clippings. From a management standpoint, increased foliar growth just means more mowing.

Stress management in turfgrass will be concluded in the August issue of A Patch of Green.

One of the most tragic things I know about human nature is that all of us tend to put off living. We are all dreaming of some magical rose garden over the horizon - instead of enjoying the roses that are blooming outside our windows today.

- Dale Carnegie

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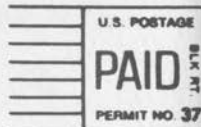
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