

A Checklist Against Adversity

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There have been numerous "check-lists" with regard to anticipating turf maladies resulting from various fungi, nematodes, and men. Such lists are merely guides, as both authors and users are well aware that fungi, nematodes, and many men do not have the necessary facilities to read and understand such lists.

Nonetheless, quite accurate predictions can be made concerning factors likely to exist under a given set of conditions, and the influence of these factors on the wellbeing of the turf. One of the simplest systems of check-listing, and perhaps the most accurate, is concerned with the seasons of the year. Of course, a knowledge of the disease syndrome is necessary. Let's establish the distinct seasons, then check-list what can be expected when adversity comes:

I. Cold—Wet

II. Cold—Dry

III. Cool to Warm—Wet

IV. Cool to Warm—Dry

V. Warm to Hot—Wet

VI. Warm to Hot—Dry

VII. The Entire Season

I. SEASON: COLD—WET.

A. Fungi: The checklist for proper procedure here is more accurate and well understood than it is for any other season because the environment can be more closely predicted.

1. Insure drainage, both surface and sub-surface. Puddled water (or ice) can be devastating.

2. Do not allow greens to "go into winter" in a lush, overfed condition. Preferably turf should be slightly on the hungry side.

3. Continue regular short height of cut until turf growth ceases.

4. Most golf course superintendents advocate an early fall aeration. This should be done early enough so that *Poa annua* is not encouraged at the expense of bent, and early enough to insure that aerator holes will heal prior to cold weather.

5. Thoroughly irrigate greens prior to closing and draining the watering system.

6. Apply a snow mold preventive fungicide according to manufacturer's recommendations. Make a second application during a mid-winter thaw.

7. Do not allow a continuous ice sheet (from the soil upward) to remain in place for longer than 21 days. If an ice sheet is present for this length of time, it must be removed. Under extreme cold conditions, mechanical removal is recommended. Loose snow cover or an ice cover which has a layer of snow beneath is not considered dangerous.

8. Apply the snow mold fungicide again when turf begins to grow in the spring. This application may be of far greater importance than realized by many.

9. Commence mowing as soon as turf initiates growth.

10. As is the case at all times, follow proper maintenance practices.

B. Nematodes:

1. Eelworms are either dormant or in the egg stage during cold weather. To date our knowledge indicates that nothing can be done in regard to their control at this time. However, if top-dressing is prepared during cold months, it should be sterilized if at all possible. If soil is too cold for sterilization, it should be treated as soon as the soil temperature allows.

C. Man

1. The "adversity checklist" here usually concerns a biped known as *homo sapiens* carrying a sled or toboggan. Various practices designed to counteract this malady have been employed, such as fences, brush piles, mean dogs, and shot guns, usually with limited success. Winter sport enthusiasts can be extremely damaging to greens and other turf areas. Good fences are about the best deterrent. Occasionally law enforcement officials are employed.

2. Turf can be damaged excessively if play is allowed when the soil has thawed to a depth of 1 or 2 inches. Either play should be restricted at these times or alternate tees and greens should be made available. An excellent practice to follow is "keep as much traffic as possible off greens and tees during cold—freezing weather."

II. SEASON: COLD—DRY

A. Fungi: If one could be assured that an open, dry winter were ahead, there would be much less need for taking the many precautions listed in Fungi-Wet above. However, there is never a guarantee of this, so such precautions must be taken. Furthermore, where open, dry winters are frequent:

1. Either place snow fence in proper places around greens, or pile brush on greens, or both. Considerable work has been done with regard to placing clear plastic on putting surfaces when drought conditions are expected. This definitely eliminates desiccation damage. However, few clubs have been able to afford this practice except in limited, small areas such as on a newly established green.

2. If desiccation has been a frequent problem in the past, the superintendent should see to it that a large, mobile water tank is available. Dur-

ing extreme drought a minimum of 250 gallons and preferably 500 gallons of water should be applied to each green. Two such applications may be necessary under severe conditions.

3. Many superintendents will operate their watering system earlier than considered safe if desiccation is severe. The course is watered, then the system is redrained if necessary, in order to avoid freeze damage. They believe such a practice is preferable to taking the chance of losing considerable turf.

B. Nematodes and Man behave about the same under both wet and dry conditions. Man is not as active and thus not as damaging in the absence of ice or snow for sledding. Numerous nematodes may be killed if drought is severe.

III. SEASON: COOL TO WARM OR WARM TO COOL—WET

A. Fungi: Diseases which result from attacks by fungi are considerably more damaging in a wet environment. Actually all the fungi known to be pathogenic on bentgrass can be and are active under these environmental conditions. The most commonly devastating are the genera of *Sclerotinia*, *Corticium*, *Fusarium*, *Gloeocercospora*, and *Helminthosporium*.

1. In order to cope with attacks by these fungi, the turf specialist must recognize the various symptoms, be familiar with chemical control procedures and apply fungicides as needed. An adequate preventive fungicide program is as important during this period as any other season of the year.

2. Drainage, both surface and sub-surface, is paramount. If drainage is not adequate, steps must be taken to insure it.

3. The soil must contain adequate

oxygen (air) to allow proper physiological root and biological activities. The soil also must be sufficiently "loose" so the root exploration and growth are not impeded. If the soil is "tight" and compacted it must be loosened. Many tilling tools are available for this purpose.

4. An excess of organic matter (mat-thatch-grain) encourages disease development, so it must be avoided. If excess material is present, it can be removed through mechanical means and by encouraging biological activity.

5. Nutrient levels should be balanced and adequate. Soil tests are usually required every 2 to 5 years. These are helpful in determining proper fertilizer programs. An excess, dearth or imbalance of plant nutrients can encourage disease activity.

6. Check constantly to assure that bentgrass turf areas are not being overwatered. This is a common mistake and encourages disease activity.

7. Tree root competition and shade weaken turf and predispose it to the ravages of parasitic fungi. If it can be determined that trees are a factor in the disease syndrome, corrections should be made.

B. Nematodes: The spring season or just when roots have initiated vigorous growth is the time to attack the nematodes. Both wet and dry environmental conditions are included here.

1. Presence of parasitic nematodes must first be established, then the estimated number. Obviously, nothing should be done if there are no parasites present. Extract pint soil samples from the entire area in question. A ½-inch soil corer is excellent for this purpose. Take cores to a depth of 4 to 5 inches. Mail or take them immediately to a qualified nematologist (most land grant colleges now

employ such men) and have him report the counts of parasites present. If a sufficiently large population is detected, it is suggested that test areas of 200 to 500 square feet be established as follows:

a. Aerate soil.

b. Apply ½ the recommended rate of nematocide. Nematocides currently in use are: Fumazone, Nemagon, and VC-13.

c. Water-in deeply and thoroughly.

d. In 1 week to 10 days apply the remaining ½ dose. Water-in thoroughly.

The following fall and again the following spring extract soil samples from the treated areas and from adjacent non-treated areas. Submit these samples to the nematologist in order to determine degree of control. Also, maintain a visual check to determine any continuous improvement in treated areas. If control is evident, treat entire areas.

2. The first indication of nematode-infested grass could be considered as lethargic turf or that which remained consistently diseased and "poorly" regardless of the maintenance programs followed. It is likely that nematodes are responsible for considerably more troubles in turf maintenance than attributed to them.

C. Man: Many items in the disease checklist which appear on the detrimental side of the ledger can be attributed to men. Examples are:

1. Dull mowing equipment. Mishandling of machinery and careless behavior by workmen fall into this category. Scalping is the first thing that comes to mind; surely everyone recognizes the weakening or damage to turf which results from scalping. The use of equipment in the wrong place follows as a close second. If a superintendent wishes to maintain fine bentgrass (or *Poa annua*) tees,

he had best keep his fairway mowers on the fairways. During periods of stress all heavy equipment should be kept off the greens except in cases of absolute necessity.

2. Excessive play, especially during periods of surplus moisture, encourages disease activity. However, it is your problem as to just what you are going to do about it.

IV. SEASON: COOL TO WARM-DRY

A. Fungi: Potential damage as a result of fungi activity is considerably decreased during periods of dry weather as stated under the Cold-Fungi-Dry heading. Here again, though, one cannot be absolutely certain that dry conditions will continue indefinitely. Therefore, the checklist specifies that all necessary precautions should be followed, regardless.

1. If the superintendent is careful not to overwater greens and tees during periods of drought, he may become careless about applying fungicides. However, the exception to the rule is the evidence of *Helminthosporium*. This particular fungus is frequently damaging on high, dry areas. Therefore, a word of caution—do not become complacent when dealing with these “chlorophyll-less” plants.

B. Nematodes and Men are going to behave about the same whether it is dry or wet under conditions of golf course management.

V. SEASON: WARM TO HOT-WET

This includes the hot months when stress to turf is most severe.

A. Fungi: As higher temperatures and excess moisture encourage development of fungi and discourage development of bentgrass, all known precautions must be taken to insure healthy, vigorously growing turf and to discourage development of fungi.

1. As previously stated, if adequate surface and sub-surface drainage is

not assured, this condition must be corrected. Adequate drainage is of paramount importance.

2. Be familiar with both the fungi known to be damaging at this time of year (which includes practically all of the fungi known to be parasitic on grass) and the chemical control means for these fungi. An adequate supply of fungicides must be on hand.

3. Follow a regular preventive fungicide program during these periods of stress.

4. All maintenance practices become more exacting at these times. Errors in judgment or mishandling of chemicals and equipment are compounded.

5. Major improvement or major change should not be made at this time (with the exception of improving drainage if it is apparent that this must be done). Maintenance practices should be designed primarily to keep turf growing in as healthy condition as possible.

6. If it is apparent that disease activity is gaining the upper hand, obtain the services of an authority on turf diseases.

B. Nematodes:

1. Samples can be taken at this time of year in order to determine the degree of infestation if there is reason to believe parasitic nematodes are active. However, to the best of our knowledge at the present time, treatment should be delayed until the following spring.

C. Man:

1. Workmen should be made aware that turf is in its most susceptible stage during hot-wet periods. They should be taught to operate accordingly.

VI. SEASON: WARM TO HOT-DRY

A. Fungi-Nematodes-Man: All three

of the factors are included here as the checklists for both wet and dry and should be the same when the weather is hot. Of course, the superintendent can become somewhat less careful when the weather is dry.

VII. THE ENTIRE SEASON

The entire picture is considered here. There are certain things the superintendent should checklist and be cognizant of throughout the year, such as:

1. Equipment must be constantly in good, dependable, working order. For example, if the spray machine used to treat greens were to break down on the Fourth of July, it must be either repaired or replaced immediately. Therefore, parts which experience indicates are subject to breakage should be stocked.

2. The work force should be trained and kept constantly aware of its role in the over-all course maintenance picture, especially when adversity comes.

3. An adequate supply of pesticides should be on hand, as well as necessary spare parts.

4. A friendly, understanding relationship should be maintained between members (players) and the superintendent. Obviously, such a relationship will be extremely helpful to both players and superintendent, if adversity does come.

5. Keep a constant check for signs of turf weakness or symptoms of disease activity. If it becomes obvious that a specific area regularly shows disease symptoms, the source should be determined and a plan for correction formulated and carried to completion.

6. Specifically staying on top of the job and the use of good common sense begins and ends all checklists.

We have been discussing primarily

bentgrass tees and greens. However, many clubs reached such a high level of turf maintenance that bentgrass fairways are receiving similar treatment. The practice of applying fungicides to fairway areas and in general following similar programs as for greens is increasing. If one expects to maintain bentgrass—*Poa annua* turf in the fine condition expected by many, it is becoming apparent that these extra steps are necessary.

COMING EVENTS

December 2-4

Oklahoma Turfgrass Conference
Oklahoma State University
Stillwater, Oklahoma

December 9-11

Turfgrass Conference
Texas A&M University
College Station, Texas

January 6-7, 1964

Turfgrass Conference
M.d-Atlantic Association of Golf
Course Supts. & University of Maryland
Lord Baltimore Hotel
Baltimore, Maryland

January 8-9, 1964

Turfgrass Conference
Nebraska Center for Continuing Education
University of Nebraska
Lincoln, Nebraska

January 14-15, 1964

Virginia Turf Conference
John Marshall Hotel
Richmond, Virginia

January 24, 1964

United States Golf Association
Green Section Educational Turf Conference
Biltmore Hotel
New York City, N. Y.

February 10-14, 1964

GCSAA's International Turfgrass
Conference and Show
Philadelphia Sheraton Hotel
Philadelphia, Pennsylvania

February 24-25, 1964

Southern Turfgrass Conference
Memphis, Tennessee

February 24-27, 1964

Turfgrass Conference
Cornell University
Ithaca, New York