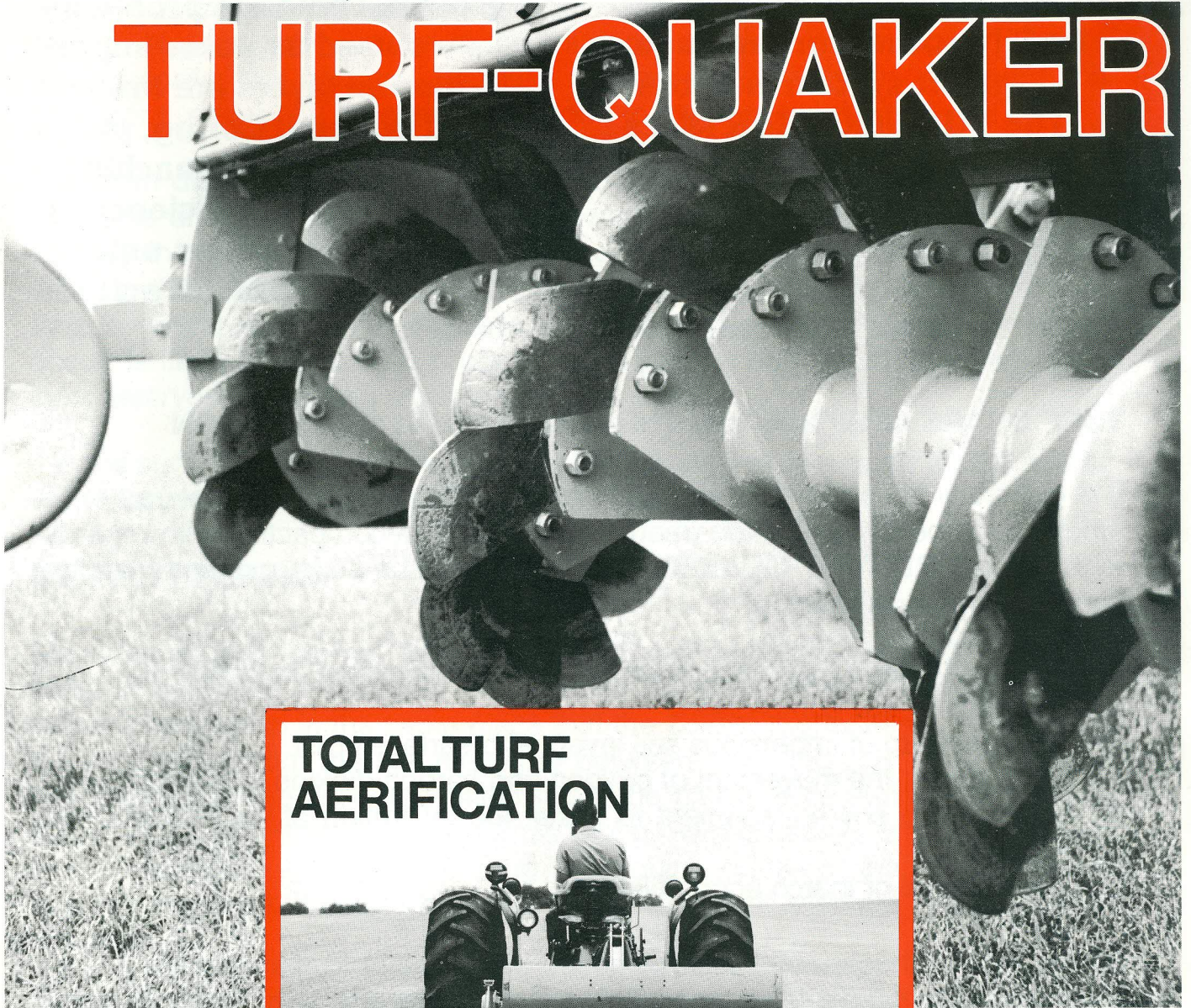


# HOWARD TURF-QUAKER



## TOTAL TURF AERIFICATION



### RELIEVES COMPACTION

Slices deep into turf, cracking compacted soil and breaking impervious layers that prevent proper drainage.

### REMOVES EXCESS THATCH

Loosens the topside of the turf with a firm shaking action that breaks away the matted thatch.

### OPENS SOIL FOR NUTRIENTS

Now air nutrients and water reach deep to the roots. Result: softer, greener, healthier turf in all seasons.

# MODEL HR 20 TURF-QUAKER

**The Howard TURF-QUAKER is the key to softer, greener turf. No other turf management system is better.**

**The TURF-QUAKER slices into compacted turf and loosens it with a vigorous, side-to-side quaking action.**

**In a single pass, soil is opened to air, nutrients and water.**

**Roots are freed for healthy growth. Drainage problems are solved as water-imperious soil layers are broken and opened. Coring, plugging or spiking machines can't match the efficiency or effectiveness of this unique TURF-QUAKER action.**

## **TURF GRASS AERIFICATION THROUGH SOIL DECOMPACTION**

It is generally accepted that soil decompaction in turf grass is a vital part of turf management. Aerification (more appropriately decompaction with regards to the HOWARD TURF-QUAKER) is considered to be as important as fertilization, irrigation and mowing.

The principal aims of soil decompaction in turf grasses are as follow:

1. The relief of soil compaction.
2. The break-up of impervious soil layers and surface crust.
3. Make easier the movement of oxygen and carbon dioxide in the soil.
4. Improve the soil environment to assist the infiltration of water and other additives.
5. The removal of thatch accumulation.

Perhaps all of these may be summarized as the need to maintain the soil in such a condition that air, water and plant food may move beneath the ground surface and into the plant root system with the least possible obstruction.

Golf courses, parks, public gardens and athletic playing fields are now subjected to very much more surface traffic than they were a few years ago. Quite apart from the increase in the number of human feet that tread and compact the soil, there are countless numbers of tractors, riding mowers, golf carts and other wheeled vehicles that add greatly to the problem. This problem is recognized and the need for turf aerification is accepted. The HOWARD TURF-QUAKER's ability to completely relieve solid compaction offers substantial improvement and advantages over other types of existing aerification equipment now being used.

## **EXISTING EQUIPMENT**

### **Spike Machines**

Probably the oldest and least effective aerating tool is the spike device. This employs a solid tine or spike to drill a hole into the ground, allowing both air and moisture to enter the soil to the full depth of the hole. The spiker is quite an aggressive tool and may be made to work in relatively dry and hard soil conditions, especially if weights are added to assist penetration.

The main disadvantage of this type of equipment is that in making the hole, the spike displaces upwards and downwards the earth around the hole and actually increases soil compaction in the vicinity. Unless ground conditions are dry, the sides of the hole will possibly be smeared or glazed, and may thus be impervious to the passage of moisture and air. Infiltration, if it does occur, is likely to be a slow process, although the hole itself does provide a local reservoir for holding moisture and nutrients.

If a soil surface has been crusted over, then the spiker is a good tool to use at very shallow depth to break that crust.

### **CORING MACHINES**

Machines of the "coring" type have been well accepted as good aerifying tools. In removing a complete plug of soil from the ground, they effectively relieve compaction in the same place that the spiker aggravates it. The size of the core taken from the soil may vary between 1/4" and 5/8"; and holes of this magnitude are likely to remain for some time before surface traffic and water, etc., cause them to close. Grass root growth is usually greatly improved in the immediate vicinity of the plug hole, but because of the very localized effect of the corer, it has to be used at fairly frequent intervals to be properly effective.

Speed of operation of the self-powered coring machine is relatively slow; and while this is acceptable on greens and other confined areas, it is scarcely practical in fairway maintenance. A great advantage to this machine is that the composition of the soil may actually be changed by returning to the holes created the desired material.

### **SLICING MACHINES**

The third type of machine used for aerification is a unit that slices the soil. The cutting blade, disc or knife may be independently powered, or it may be counted on a free-turning rotor that revolves in accordance with the travel speed of the machine.

# TURF GRASS AERIFICATION...

It is likely that these free-turning machines will require additional weight added to them to make them penetrate firm ground; and this in itself indicates that they probably contribute to compaction, rather than alleviate it. The slits drawn in the ground are quite narrow; and while they allow water to infiltrate for awhile, they tend to seal quickly - certainly more rapidly than the holes produced by a corer. Machines of this type are usually more rapid in operation, which compensates the need for more frequent use.

Slicing machines which have independently powered blades have much more to offer. They make a positive cut in the soil and require no additional weight applied to the machine in order to assist penetration. They do not add to soil compaction unless ground conditions are too moist, in which case the sides of the slot made in the soil may be glazed. As with the coring machine, their effect is localized; and repeated use is necessary to maximize their effectiveness.

## **THE HOWARD AERIFYING AND SOIL DECOMPACTION TURF QUAKER**

The HOWARD TURF-QUAKER is an aerifying machine, or more appropriately, a "decompaction" aerifier of the powered slicing type; but it has numerous design advantages that make it very superior, and it substantially overcomes the localized effects that have been noted with other slicing and coring machines.

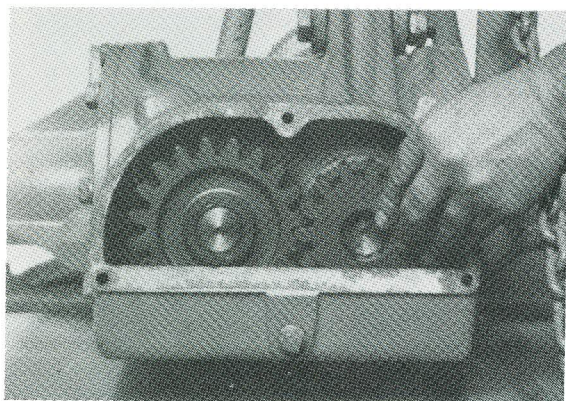
Rather than mounting blades straight across a power-driven rotor, the HOWARD TURF-QUAKER slitting blades are mounted in a scroll (or corkscrew) pattern. In operation, this results in one blade slicing down and part way through the ground before the adjacent one touches the soil surface. Each blade is sufficiently thick that besides parting the turf and soil along the line of cut, it actually forces the soil to one side. As the next blade in the progression enters the ground, it forces the soil back to its original position. If the moisture content of the earth is correct - neither too wet nor too dry - this sideways movement shatters the soil around the grass roots to the full depth of blade penetration and right across the strip of soil between any two adjacent blades. This action gives full relief from soil compaction.

In addition to having a carefully designed scroll pattern on the rotor, the blades themselves are set laterally at a critical distance from each other. This spacing (approximately 4 1/4") is not so large that the soil shattering effect will be incomplete between any pair of blades, nor is it so small that the turf between the blades will be torn out of the ground all together. The weight of the machines is carried on two pneumatic flotation tires, and depth control is infinitely variable from surface level to approximately 4" maximum. In most circumstances, a working depth of two to three inches is most practical.

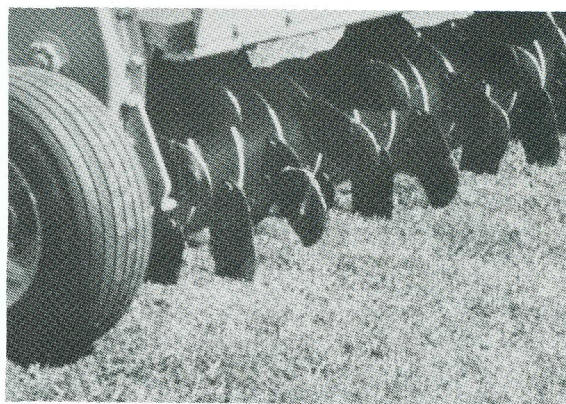
# ...THROUGH SOIL DECOMPACTION

Power requirement for the HOWARD TURF-QUAKER varies with degree of soil compaction, soil type, moisture content and depth of cut. In dry and hard soils where a coring machine may not penetrate, power consumption will go up markedly. The factor which keeps average power requirements in a low range relates to the blade's scroll arrangement. This ensures that no more than two or three blades are entering the ground at any given moment, and there cannot be the same heavy loading as would apply if the blades were mounted in a straight line across the rotor.

The HOWARD TURF-QUAKER is extremely versatile and will work in virtually any soil type. In heavily rooted grasses which are subject to much thatch accumulation, the unit works as well as it does in fragile peat soils where grass rooting systems are almost nonexistent. The secret of this is the multi-rotor speed SELECTATILTH gearbox fitted to every HOWARD TURF-QUAKER. Use of this gearbox permits the speed of blade rotation to be increased or decreased at will. In tough grasses that have creeping root systems, blade speed can be reduced to give the most aggressive action, tearing out thatch, severing roots and thoroughly fracturing the soil. Vigorous treatment of this sort in weakly-rooted structures might result in pulling all the turf away from the soil; but by changing gears and increasing blade speed, the severity of blade action is reduced, allowing weak-rooted systems to be handled without damage but still maintain the same positive alleviation of compaction throughout the treated layers of soil.

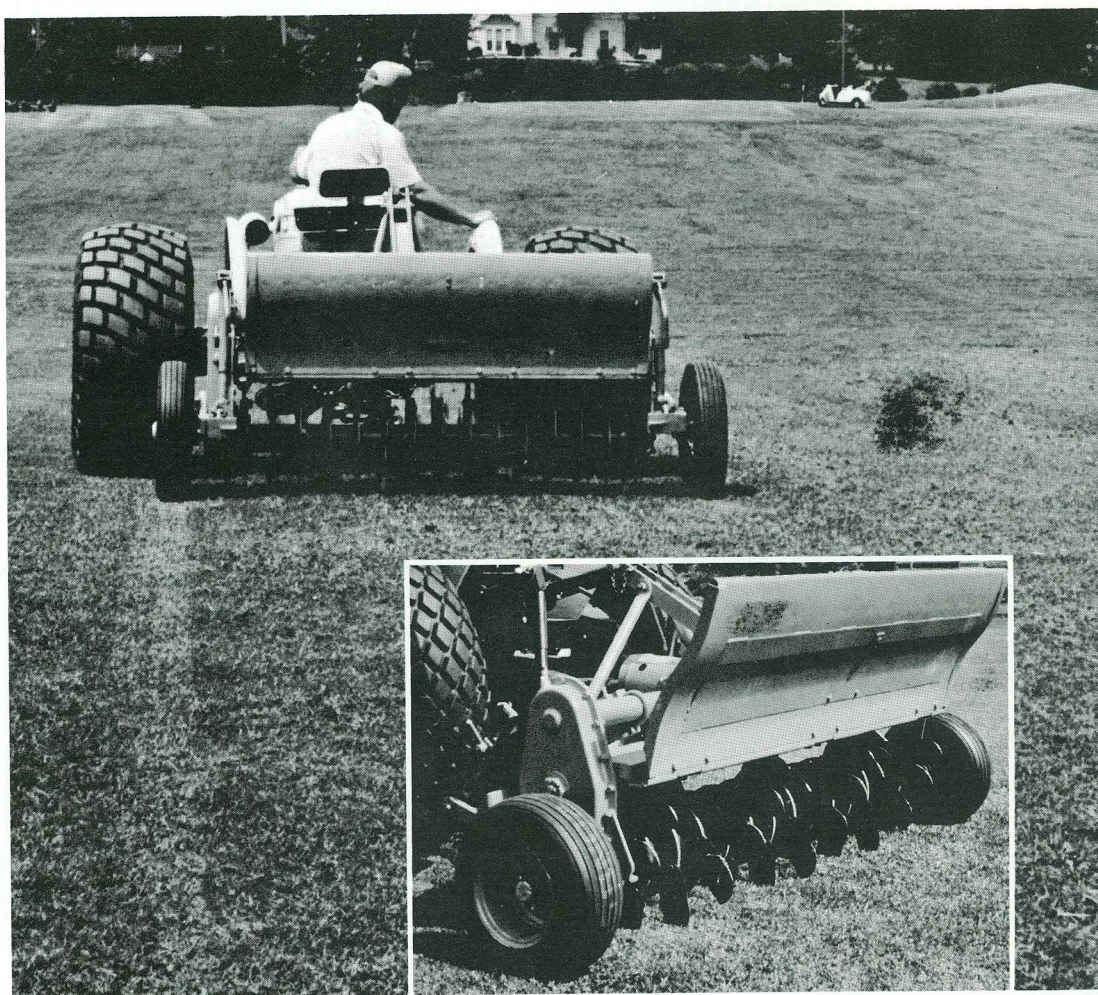


Rotor speed can be adjusted to match soil's condition; from soft and moist, to dry and bone-hard, with the exclusive Howard "Selectatilh" gearbox.



Hardened Alloy steel blades slice into dry, compacted soil while the unique auger-like action of the rotor shakes the turf from side to side to loosen the root-bound mat and shatter the soil around and under it. Flotation wheels insure accurate depth control from 1" to 4".

HOWARD TURF-QUAKERS are powered by agricultural tractors with category I or category II 3-point hitch arrangements and 540 rpm power takeoff. Average horsepower requirements is between 35 PTO horsepower and 45 PTO horsepower for best work, but if need be, it may accept a maximum of 60 PTO horsepower. It has proven acceptable to operate that weight tractor equipped with wide flotation tires with a HOWARD TURF-QUAKER on golf course greens and other very fine playing surfaces. When conditions are so extreme that some remedy is demanded, the net relief of soil compaction is still greater with a tractor-mounted machine than what it would be with any other form of equipment. It is recommended that experimentation be conducted on your greens nursery or practice-putting surface to see whether the end result is to the greenskeeper's satisfaction.



### **TOTAL TURF AERIFICATION**

In a single pass, the Turf-Quaker will completely relieve compaction and open the soil for nutrients. The machine slices through the turf to crack and shatter the impervious layers that prevent proper drainage. At the same time, the top-side of the turf is loosened with a firm shaking action.

Now air, nutrients and water can again reach deep to the roots, resulting in softer, greener, healthier turf in all seasons.

# HOWARD HR 20 TURF-QUAKER

## Two Machines In One

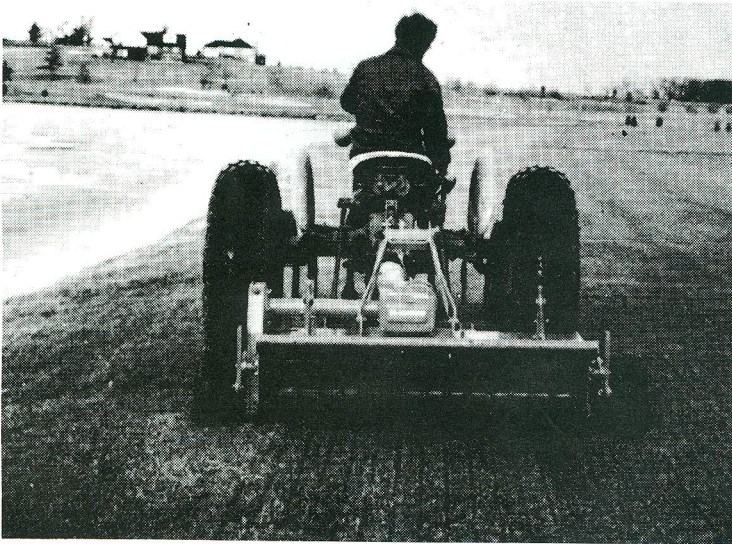
This 5 ft. Commercial Turf Renovation Machine both aerifies and relieves surface compaction with a unique slicing and shaking action.

The soil is opened for nutrients and water intake without any surface damage.

The Turf-Quaker is supplied as a complete Rotavator/Turf-Quaker combination machine.

With quick change turf or tilling rotors, it can be relieving compaction on an athletic field in the morning and tilling/mixing sub base for a new pathway in the afternoon or preparing a seedbed for a newly landscaped area requiring seeding.

A truly versatile machine that can tackle a wide variety of jobs for landscapers, golf courses, city parks, school districts, athletic fields and highway departments.



# MODEL HR 20 TURF-QUAKER

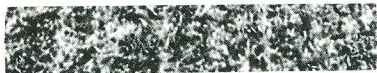
## RECONDITIONS COMPACTED TURF IN A SINGLE PASS

Compacted turf is starving turf. It needs air, moisture and nutrients, and shows it by losing its green, healthy appearance and becoming matted with thatch.

The TURF-QUAKER is the fastest, most effective way to recondition starving turf on golf courses, parks, cemeteries and athletic fields. Maintenance vehicles, mowing equipment and heavy foot traffic all contribute to compaction. The TURF-QUAKER loosens compacted soil with a unique slicing and quaking action, while also improving drainage and removing excess thatch. A single pass is all that's needed for softer, greener turf—even in dry seasons of hard usage!

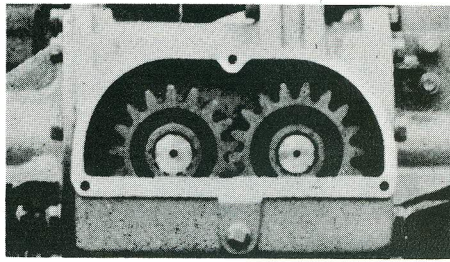
## WORKS UNDERGROUND AND LEAVES SURFACE CLEAN

Compacted turf problems occur at root level—exactly



where the TURF-QUAKER works. It slices to the root zone, cutting tangled roots and shattering hard soil layers. And yet, despite this vigorous underground action, the grassy surface remains undamaged. The recovery rate is extremely fast following just one pass, provided water is available.

## DEALER



## ADJUSTABLE ROTOR SPEED AND DEPTH CONTROL

Turf conditions vary greatly, but the TURF-QUAKER has the versatility to handle them all. Howard's SELECTATILTH feature lets the operator choose different rotor speeds to match varying soil and turf conditions. Changing rotor speeds takes just minutes and requires no special tools.

The TURF-QUAKER also offers adjustable depth control. Twin wheels with flotation tires maintain precise working depths from 0 to 4 inches.

## DESIGNED TO PERFORM ...BUILT TO LAST

The TURF-QUAKER is built by Howard, manufacturer of the world-famous ROTAVATOR line of rotary tillers. (In fact, it may be easily converted to a full-fledged ROTAVATOR for general tillage use!) Like all Howard equipment, the TURF-QUAKER is designed for hard work in difficult conditions. Safety clutch equipped, it requires minimum horsepower for maximum turf-renewing results.

## SPECIFICATIONS

**Working With:** 60"

**Power Range:** For tractors from 35 to 65 H.P. with 540 rpm PTO. Optional gears for 1000 rpm PTO available.

**Linkage:** Category 1, 3-point hitch.

**Blade Pattern:** Blades spaced 4" apart in scroll pattern.

**Working Depth:** Adjustable to 4" via twin depth-control wheels and flotation tires.

**Rotor Speeds:** 165, 190, 210 & 235 rpm with standard SELECTATILTH gears at 540 PTO. Additional speeds with optional gears.

**Machine Weight:** 980 lbs.



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