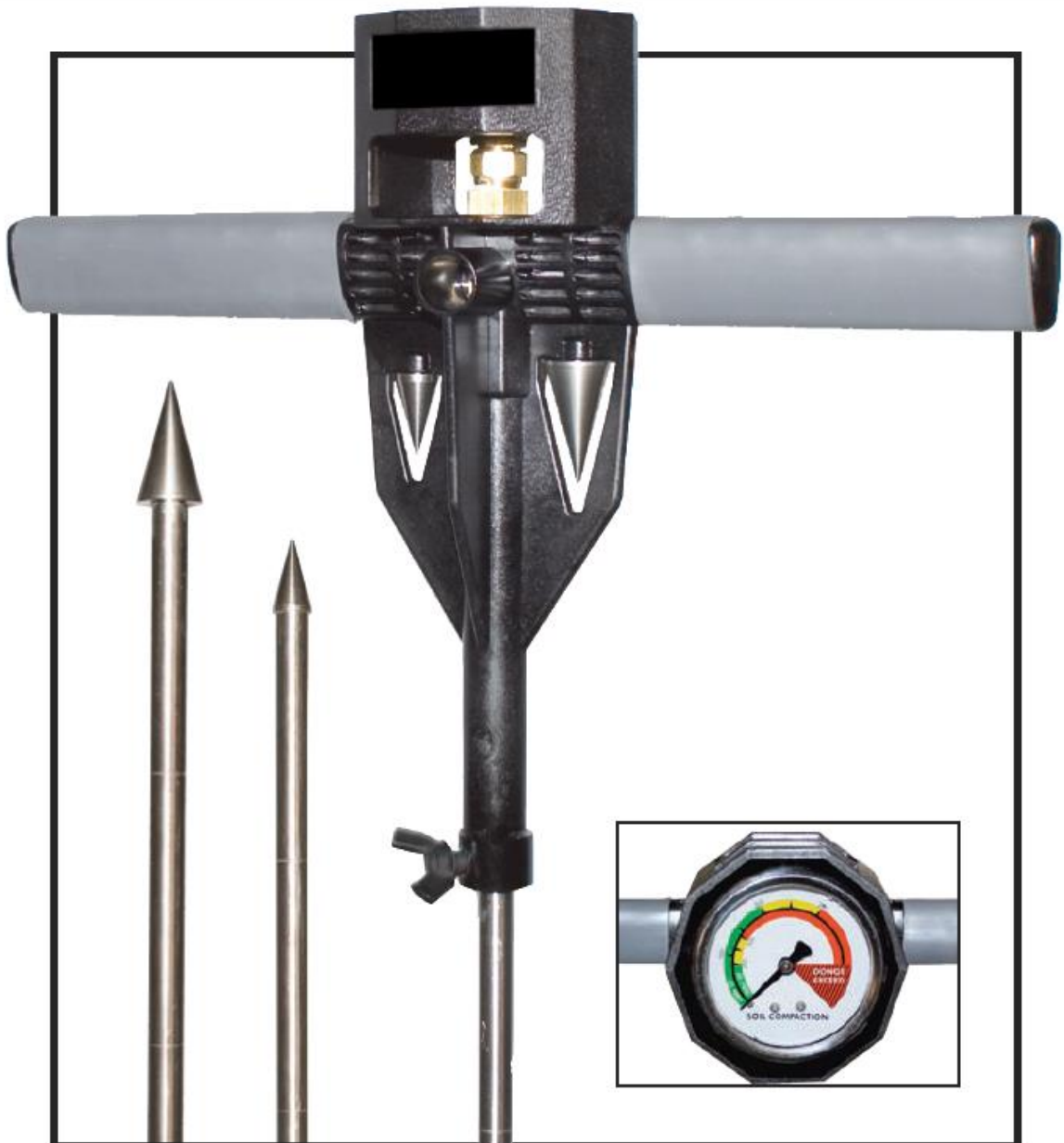


Instructions
**SOIL COMPACTION
TESTER /
DIAL PENETROMETER**





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CAUTION: The Soil Compaction Tester may cause harm if used improperly. Please use the pointed tips with care and check with underground utility companies before using at deeper depths.

Introduction

THANK YOU for purchasing the Soil Compaction Tester.

READ THIS MANUAL carefully to learn how to operate and service your Soil Compaction Tester correctly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your Soil Compaction Tester and remain with the Soil Compaction Tester when you sell it.

WARRANTY is provided through Turf-Tec for customers who operate and maintain their Soil Compaction Tester as described in this manual.

This warranty provides you the assurance that Turf-Tec will back its products where defects appear within the warranty period. In some circumstances, Turf-Tec also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the Soil Compaction Tester be abused, or modified to change specifications, the warranty will become void and field improvements may be denied.

PROOF OF PURCHASE (retail sales receipt) must be included with returned tester to obtain free warranty service. Without proof, tester will be assumed to be out of warranty and repair costs will be invoiced.

RECORD SERIAL NUMBERS. Accurately record all the numbers somewhere in this manual and refer to it in all communication with the factory. Turf-Tec needs these numbers when you order parts or obtain service.

Serial No. _____

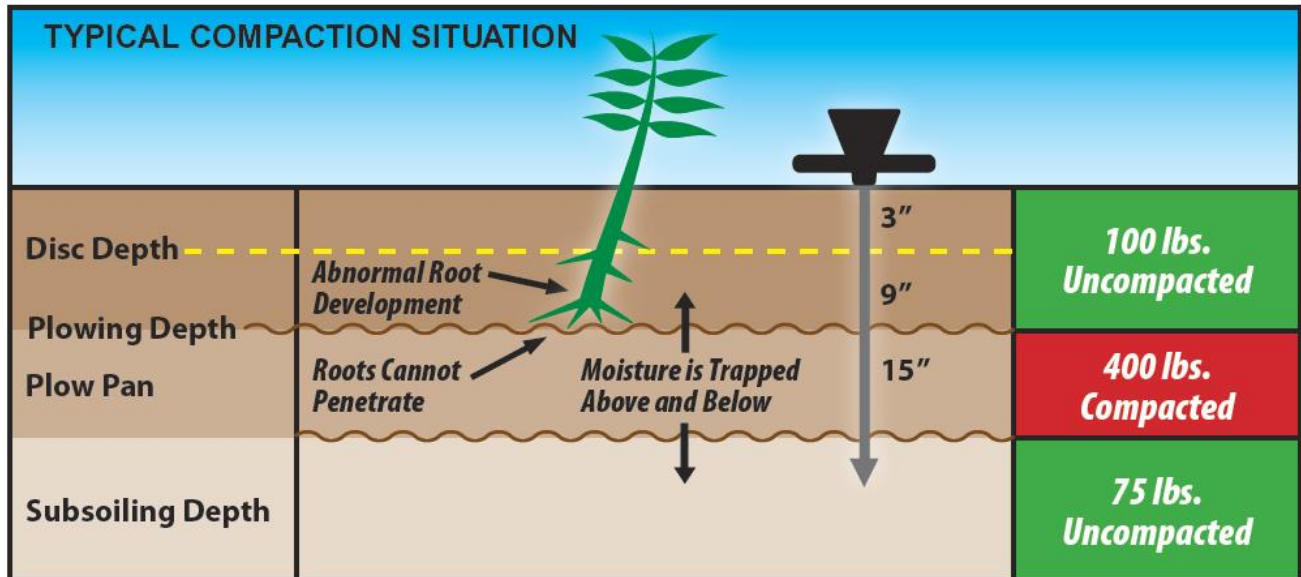
WARRANTY

The Soil Compaction Tester is guaranteed by Turf-Tec to be free from defects in materials and workmanship for one year from date of retail purchase. This warranty does not cover damage resulting from misuse, neglect, accident or improper installation or maintenance. This warranty does not apply to any product which has been repaired or altered outside the factory. The manufacturer does not assume any liability for damage from misuse, dropping the tester or damage resulting from or damage caused by water or from unauthorized repair. The warranty does not cover any damage which may directly, indirectly, consequentially or incidentally result from use or inability to use the Soil Compaction Tester. The foregoing warranty is exclusive and in lieu of all other warranties of merchantability, fitness for purpose and any other obligation or liability in connection with its product.

WHAT IS SOIL COMPACTION?

Soil compaction can occur in any type of soil. Years of traffic, tillage and settling can cause soil particles to group together and fill in air spaces in the soil creating a “plow pan” below the tillage area. When this happens, a hard layer is formed making it difficult for moisture and roots to penetrate the soil.

Some soil types are more susceptible to compaction than others; but once a compaction layer is formed, and moisture and traffic continues, the compaction layer will continue to get denser and thicker.





WHAT ARE THE IMPACTS OF A SOIL COMPACTION PROBLEM?

Farming

1. Compacted soil is much harder to work. This will cause you to use more power and take longer to till, wasting fuel, time and money.
2. You may already be aware of soil compaction but not have the tools to determine if it is a problem. For example, unnecessarily trying to correct soil compaction by tilling to a deeper depth can be a waste of time and money.
3. Your crop yield can be reduced by as much as 50% because of poor root and plant development.
4. Compacted soil can prevent water from penetrating deeper into the soil. This can reduce plant development and yield especially during dry periods with no rain. Compaction can also lead to surface water retention making the field more difficult to work in the spring and fall seasons.
5. In compacted soil, fertilizers, pesticides and herbicides can more easily be washed away and not absorbed or even become more concentrated causing plant damage. This can result in reduced crop yield.

Turfgrass

1. Compacted soil make it much more difficult to grow grass.
2. You may already be aware of soil compaction but not have the tools to determine if it is a problem.
3. Your turfgrass quality can be reduced by as much as 50% because of poor root and turf development.
4. Compacted soil can prevent water from infiltrating deeper into the soil. This can reduce turf development especially during dry periods with no rain. Compaction can also lead to surface water retention.
5. In compacted soil, fertilizers, pesticides and herbicides can more easily be washed away and not absorbed or even become more concentrated causing turfgrass damage.

WHAT TO DO ABOUT A SOIL COMPACTION PROBLEM?

Farming

If you have determined that you have a soil compaction problem and at what depth the compaction exists, your solution could be as easy as one of the following:

- Reducing traffic in the affected areas of the field.
- Seeding cover crops that will improve water management.
- Choosing a tillage tool that will penetrate the compacted area of the field.

Your local agricultural extension office is a good source of information to help you determine what can be done to help correct and prevent soil compaction problems.

Turfgrass

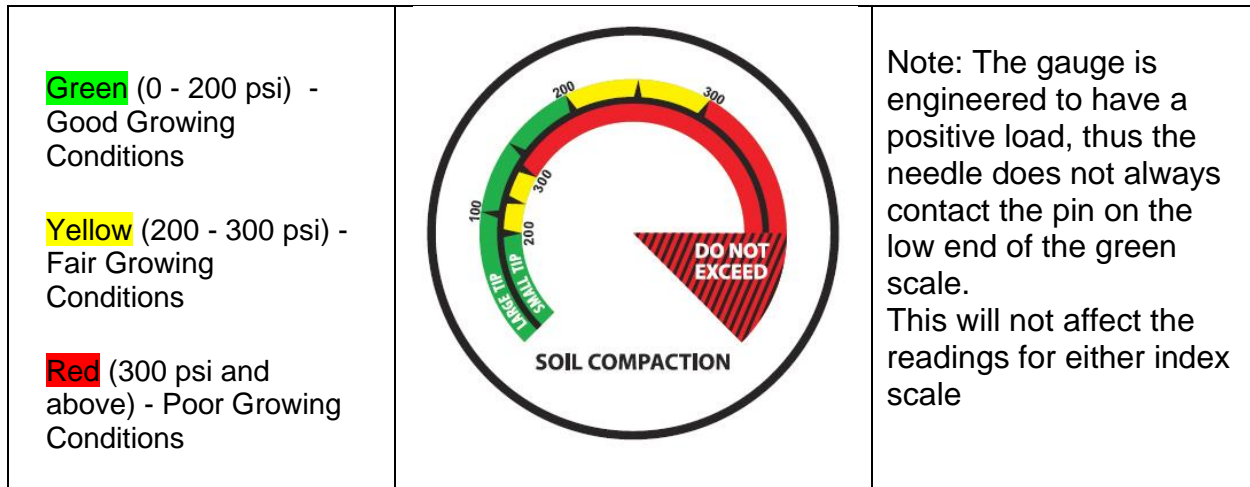
If you have determined that you have a soil compaction problem and at what depth the compaction exists, your solution could be as easy as one of the following:

- Reducing traffic in the affected areas.
- Deep Aeration at depths deeper than where compaction is highest.
- Infiltration rates should also be monitored with an Infiltrimeter if compaction is present to determine if high compaction levels is also decreasing water infiltration.

WHAT IS A SOIL COMPACTION TESTER?

Your Soil Compaction Tester is a Penetrometer which measures the compaction of soil and is based on the ASAE S313.3 standard. The tester is supplied with two tips: a small tip (1/2" diameter) for use in firm soil and a large tip (3/4" diameter) for use in soft soil. The dial has two scales (one for each tip) that are calibrated in pounds per square inch of the base area of the cone shaped tip.

THE DIAL IS COLOR-CODED FOR REFERENCE



Best time to use the Soil Compaction Tester

Farming

The best time to use the Tester is in early spring before you till the soil. The soil should have a good moisture content because the moisture content and soil texture will affect the readings of the Soil Compaction Tester.

It is best to compare the readings of the same soil type and moisture content. Check a fence row and then check the field area for comparison. Several tests should be made in an area to get a more accurate reading. The Soil Compaction Tester will help you determine if you have a compaction layer and, if so, the depth of the layer. After tilling, the Tester will determine how deep you actually worked the soil and if your tillage operation solved the problem.

Turfgrass

The best time to use the Tester is at the same time period each day. If you irrigate daily, test at least two hours after irrigation and only if on rainfall has occurred within a 48 hour period. Soil moisture is key to being able to compare your compaction readings over time so it is highly suggested that you also measure and record your soil moisture readings each time you check your compaction with a moisture sensor to ensure soil moisture is in the same range each time you test. If soil is wet one time and dry the next time you test, compaction trends will not be comparable.

Different soil textures will also affect the readings of the Soil Compaction Tester.

Unpacking the Soil Compaction Tester

Remove the Soil Compaction Tester from the box. An adjustable shock collar is installed on the shaft of the Soil Compaction Tester next to the plastic housing. This collar is used during shipping and storage to protect the dial from damage should an impact on the shaft occur. Loosen the wing nut on the shock collar and slide it down at least an inch away from the plastic housing. Visually inspect the Tester for damage and check that the gauge indicator is pointing to “0”. If it is not, pull on the shaft or gently tap the glass on the gauge. If it does not return to “0” contact the Turf-Tec customer service department.

The gauge is filled with nontoxic, non-flammable silicone oil. You may notice a small air bubble in the dial face which is perfectly normal. The silicone oil is used to dampen the shock to the gauge in case the Tester is dropped. If the silicone oil is leaking from the dial contact the Turf-Tec customer service department.

Your Soil Compaction Tester has a built in hanger hole in the back. Using the supplied nail, the Tester can be conveniently hung and stored on a wooden beam, wall or even above a work bench.

Storage of the Tester by hanging prevents damage during times when it is not in use.



USING THE SOIL COMPACTION TESTER

1. Loosen the wing nut on the shock collar and slide the collar down the shaft at least 1” away from the plastic housing.
2. Your tester includes 2 tips (large and a small) that are stored in the tester housing. The tips can be removed by simply unthreading them from the housing. (The tips are threaded on to the housing not snapped on).
3. Choose the tip that best suites the type of soil you have. The small tip is used for firm soil and the larger tip is used for loose soil.



*It is recommended that you start with the small tip and obtain some readings. If you feel the readings are very low or the soil is very loose then change to the larger tip.

Once you have chosen a tip, thread the tip on to the end of the Soil Compaction Tester's shaft.

Note: No valid readings can be obtained from the tester if a tip is not attached to the end of the shaft.

4. Position the tip of the tester on the ground in the area you wish to test. Apply even downward pressure on both handles of the tester to keep the shaft and tip penetrating the soil at a slow even pace.
5. The tester shaft is marked at three inch intervals for easy depth measurement. As the tester's shaft penetrates the soil, record the gauge readings at the 3", 6", 9" 12", 15" and 18" depths. (Be sure to use the correct scale for the size tip that you are using on the shaft as indicated on the dial face)
6. A compacted layer can be determined by the gauge indicator increasing upward into the red range and then moving back down into the yellow or green after passing through the compacted layer. The depth of the beginning of the compacted layer and depth of leaving the compacted layer should be noted.

Note: multiple readings must be taken from each area being tested. To get an accurate determination of whether or not you have a soil compaction problem and at what depth the problem exists. The same procedure should be repeated in other areas of the field as well. One area may not represent the condition of the whole area being tested.

7. When the tester is not in use, loosen the shock collar's wing nut and slide the shock collar up the shaft until it comes in contact with the plastic housing and tighten the wing nut. This will help prevent damage to your Soil Compaction Tester.

LIMITED WARRANTY OF TURF-TEC INTERNATIONAL PRODUCTS

Turfgrass Products Corporation - dba - Turf-Tec International ("Seller") warrants to the final purchaser, that all Turf-Tec International tools will be free from defects in material or workmanship for a period of one year from date of purchase. SELLER'S SOLE OBLIGATION AND YOUR EXCLUSIVE REMEDY under this Limited Warranty and, to the extent permitted by law, any warranty or condition implied by law, shall be the repair or replacement of parts, without charge, which are defective in material or workmanship and which have not been misused, carelessly handled, or improperly repaired by persons other than Turf-Tec International. To make a claim under this Limited Warranty, you must return the complete tool, transportation prepaid, to Turf-Tec International after contacting Turf-Tec International and receiving a return authorization number. Please include a dated proof of purchase with your tool.

ANY IMPLIED WARRANTIES SHALL BE LIMITED IN DURATION TO ONE YEAR FROM DATE OF PURCHASE. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING BUT NOT LIMITED TO LIABILITY FOR LOSS OF PROFITS) ARISING FROM THE SALE OR USE OF THIS PRODUCT.

Hold Harmless Agreement

The seller shall protect, defend, indemnify and hold the purchaser and their respective assigns and their attorneys, accountants, employees, officers and directors harmless from and against all losses, costs, liabilities, claims, damages and expenses of every kind and character, as incurred, resulting from or relating to or arising out of the inaccuracy of results, injury of user, injury of sports participant, turfgrass loss, warranty, covenant or any agreement made by the seller in this agreement.