

MEASURE SOIL DENSITY

The Piket Penetrometer enables you to measure soil density and to identify compacted soil.

1. Measure soil density
2. Identify compacted soil
3. Take a calculated decision
4. **Improve soil health**
5. Keep monitoring



Penetrometer colour reference indicator:

- Most crop roots grow well in the green range.
- Most crop roots grow fair in the yellow range.
- Most crop roots grow poor in the red range.



Visit: www.piketmeter.co.za

RUNOFF - erosion

SURFACE CRUST - if dry

TOPSOIL

Roots restricted to topsoil

SURFACE COMPACTION
(Tightly packed crumbs with no structure)

- Heavy machinery
- Foot traffic
- Over-tilling
- Work with wet soil

Poor root development

PLOUGH OR TILLAGE PAN
(Just beneath the plough depth)

Roots cannot penetrate pan layer

DEEP OR SUBSOIL COMPACTION

Piket
Implements



+27(0)22 913 2435
36 Kloof Street, Piketberg 7320

info@piket.co.za
www.piket.co.za

PIKET PENETROMETER

Table of Contents

01

Understanding Soil Compaction & Your Readings

What the penetrometer measures, what PSI readings mean, what can be measured, why compaction matters, and the key takeaway.

02

Technical Specifications & Quick Reference

Product overview, technical specifications, key features, pressure gauge reference, and component labels.

03

How to Use the Penetrometer

Initial sample, why multiple readings matter, what affects the reading, how to use the result, field capacity and compaction, and finding the compaction layer.

04

Safety First

Safe handling guidelines, do's and don'ts, warning, and disclaimer.

05

Data Recording Sheet

Recording readings by date, location, soil type, moisture condition, PSI, and depth.

PIKET PENETROMETER

Understanding Soil Compaction & Your Readings

WHAT IS IT?

The Piket Penetrometer measures soil hardness for agriculture.

Soil hardness directly impacts water infiltration and root development — critical factors for farming success.

PSI READING GUIDE

Below 200 PSI

GOOD — most crops grow well

200–300 PSI

MODERATE — crops can still manage

Above 300 PSI

POOR — root development is restricted

⚠ **Soil type** and **moisture** affect the reading.
Always consider these factors when interpreting results.

WHAT CAN YOU MEASURE?

- Soil compaction layer depth
 - Effect of animals before & after grazing
 - Effect of tilling (before and after)
 - Whether tilling addresses compaction
 - If the planter/seeder can plant in current conditions
 - If soil is deep enough for root development
-

WHY COMPACTION MATTERS

When soil compacts, natural cavities disappear and penetration resistance increases. This resistance indicates whether roots can still grow effectively. Highly compacted soils can slow or block root growth — trees and crops can even die from root suffocation.

KEY TAKEAWAY: The air/oxygen content and moisture supply of soil depend on penetration resistance. The penetrometer helps you decide if conditions are right for planting.

PIKET PENETROMETER

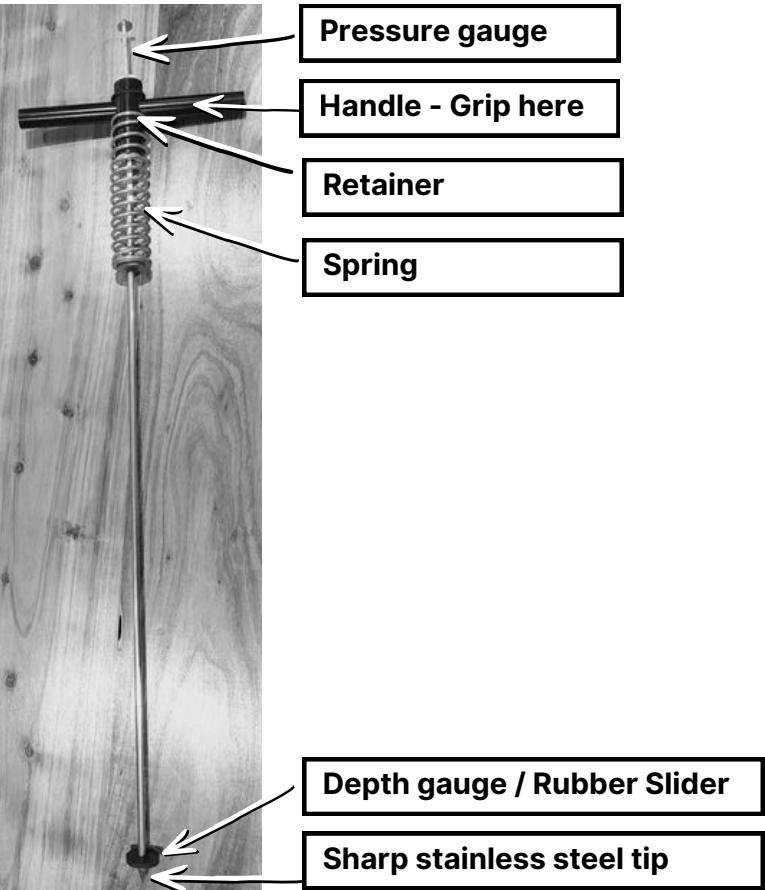
Product Specifications & Quick Reference

OVERVIEW

The Piket Penetrometer is a handheld soil compaction measurement tool designed for agricultural fieldwork. It measures resistance at depths up to 700 mm across a pressure range of 200–600 PSI.

TECHNICAL SPECIFICATIONS

Model Number	PPT-01-1100
Measuring Depth	Up to 700 mm
Pressure Range	200 – 600 PSI
Standard Tip Diameter	13 mm
Loose-Soil Tip Diameter	19 mm (optional extra, not included)
Weight	1.7 kg



Pressure Gauge	
Pound per square inch (PSI)	
2 =	200 PSI
3 =	300 PSI
4 =	400 PSI
5 =	500 PSI
6 =	600 PSI

KEY FEATURES

- Handheld, no batteries or power required
- Stainless steel construction for durability
- Easy-read pressure gauge (200–600 PSI)
- Depth markings up to 700 mm
- Interchangeable tips (13 mm standard)
- Lightweight at only 1.7 kg

HANDLING NOTES

⚠ The penetrometer has a **sharp stainless steel tip**. Always keep the tip pointed away from yourself and others. Store with the tip covered when not in use.

HOW TO USE THE PENETROMETER

1. INITIAL SAMPLE

- Move the rubber slider to the bottom of the shaft.
- Press the penetrometer into the soil to the required force (PSI).
- Take 2–3 readings close together, using the same pressure each time.
- Do not reset the rubber slider between readings — this gives a reliable average.

2. WHY MULTIPLE READINGS MATTER

- A single reading represents only a small part of the field.
- Take several readings across the area until a consistent average appears.
- Discard obvious outliers (e.g. readings caused by a rock or air pocket).

3. WHAT AFFECTS THE READING

- **Soil type** — different soils give different resistance values.
- **Soil moisture** — dry soil reads harder; wet soil reads softer.
- **Obstructions** — rocks, roots, or air pockets can distort a reading.

Always consider these factors when interpreting your results.

4. HOW TO USE THE READING

Seeder / Planter suitability

Hard soil is not always compacted — it may simply be dry. Check whether your seeder or planter has enough down-force to open a furrow, place the seed at the correct depth, close the furrow, and press the soil for good seed-to-soil contact.

Before-and-after comparisons

Limit variables to learn cause and effect. Compare readings taken on the same day, at the same temperature, or in the same spot — for example before and after tillage, before and after grazing, or before and after rain. You can also compare undisturbed soil (e.g. under a permanent fence line) with the working field.

5. FIELD CAPACITY & COMPACTION

- Measure compaction when the soil is at **field capacity** — moist but no longer draining.
- Dry soil gives a falsely high reading; saturated soil gives a falsely low reading.
- At field capacity, readings should be **below about 300 PSI**.
- If readings exceed 300 PSI, the soil is likely compacted.

6. FINDING THE COMPACTION LAYER

- Press the penetrometer slowly into the soil.
- If resistance drops suddenly, you have passed through a compaction layer.
- Note the reading, then reset the gauge 50–100 PSI lower.
- Press in again until the gauge makes contact, and repeat 2–3 times.
- Check the rubber slider to see the depth of the compaction layer.



SAFETY FIRST

Piket Penetrometer — Safe Handling Guidelines

DO

- Work in a well-lit area
- Keep the tip pointed away from yourself and others.
- Use only for measuring soil compaction.
- Store safely and appropriately after use with tip covered (not leaning against a wall where it can fall over).
- Hold firmly by the handle with both hands when inserting into soil.

DON'T

- Walk or run with the tip pointing towards you
- Pass or throw the penetrometer to someone
- Use the tool for anything other than soil testing
- Leave the sharp tip exposed when not in use
- Operate without clear visibility of the work area
- Press your finger (s) between the coils of the spring - especially when force is applied.

⚠ **WARNING:** The penetrometer has a sharp stainless steel tip. Handle with care at all times.

DISCLAIMER

Patent Application Number: 2023/03021

By purchasing or using this product, you agree to the following terms:

- This product is supplied "as is."
- Piket Implements (Pty) Ltd makes no warranties, guarantees, or representations regarding the product, its information, or related services.
- Piket Implements (Pty) Ltd is not liable for any direct or indirect losses or damages resulting from the use of this product.
- Although the penetrometer is manufactured, calibrated, and tested to the best of our abilities, Piket Implements (Pty) Ltd does not accept responsibility for the quality or accuracy of readings taken with the penetrometer.

