FREE AUSTRALIAN PADDOCK GUIDE

DIY soil checks for Australian paddocks

Eight practical checks to spot common soil constraints, keep a comparable farm record and know when professional analysis is worth the spend.

Observe first. Compare like with like. Escalate when the decision needs a number.

START HERE

A soil check is a question, not a verdict

You can learn a surprising amount about a paddock with a spade, water, a few jars and a repeatable method. The aim is not to diagnose every problem yourself. It is to notice patterns early, avoid acting on a single impression and direct laboratory or agronomy spend to the places where it can change a decision.

This guide is written for Australian growers, mixed farms and horticultural businesses. It covers physical, biological and screening indicators that can be repeated at named points. Results are most useful when you record the date, location, depth, recent rain or irrigation, ground cover and soil moisture.

Potential savings come from better targeting
A DIY check may show that a problem is local rather than paddock-wide, that two zones behave differently, or that conditions are too dry for a fair comparison. That can reduce blind sampling and premature input decisions. It must not be used to avoid testing when nutrient, lime, gypsum, contamination or other material decisions require defensible chemistry.

The three parts of soil health

PHYSICAL	BIOLOGICAL	CHEMICAL
Structure, compaction, rooting, aggregation, infiltration and water movement.	Roots, earthworms and other organisms, residue breakdown and biological activity.	pH, salinity, sodicity, nutrients, toxicities and deficiencies. Most decisions here need laboratory analysis.

Safety before steel enters soil
Check for underground electricity, water, gas, irrigation and communications before pushing a probe, driving a ring or digging. Use Before You Dig Australia where relevant, confirm farm infrastructure locally, wear eye protection when striking tools and stop if you are unsure. Clean soil from tools before moving between properties or biosecurity zones.

METHOD BEFORE NUMBERS

How to make comparisons worth keeping

1. Choose questions, not convenient spots

Pick a representative point, a suspected problem point and a useful comparison. A long-undisturbed, vegetated fenceline can provide a local reference, but it is not automatically a production target. Keep unlike soil types separate.

2. Repeat within each zone

Soil varies over short distances. Use several observations in each zone rather than treating one hole as the paddock. If stones, roots or an animal burrow distort a result, move a short distance and note why.

3. Compare at similar moisture and depth

Dry clay can feel compacted even when its structure is sound. Wet soil can smear under a spade, and EC changes with water content. Record moisture conditions and use the same depth and method each time.

4. Name and photograph each point

A GPS location, point name and photograph turn an observation into a farm record. Add recent rainfall or irrigation, crop or pasture stage, traffic, grazing and any recent amendment.

A simple field record

FIELD	EXAMPLE
Point	North 03 — wheel track / North 03 — inter-row
Date and time	9 August 2026, 10:30 am
Depth	0–10 cm and 10–30 cm kept separate
Conditions	22 mm rain four days earlier; soil moist, not saturated
Observation	Ring test 18 min; clod slaked, no visible dispersion at 20 h
Next step	Repeat twice nearby; compare after the next traffic operation

YOUR LOW-COST FIELD KIT

The eight checks at a glance

CHECK	MAIN QUESTION	COST / TIME	WHEN TO ESCALATE
1. Paddock walk	Where is the pattern?	Free / 10–20 min	Persistent poor growth, erosion, waterlogging or unknown cause
2. Spade check	What is happening through the profile?	Spade / 5–10 min	Shallow roots, mottling, odour, hard layers or unfamiliar profile
3. Infiltration	How readily does water enter?	DIY ring / minutes to hours	Repeated ponding, runoff, water repellence or very slow entry
4. Slake & dispersion	Do aggregates hold together in water?	Jar + rainwater / 20 h	Milky dispersion, crusting or suspected sodicity
5. Push probe	Where does resistance change?	Rod or penetrometer / seconds	Consistent hard layer; costly traffic or tillage decision
6. Soil life count	What visible organisms and roots are present?	Spade / 10 min	Unexpected absence across moist comparison sites
7. Cotton strip	How quickly is cotton decomposed?	Cotton / 3–8 weeks	Treat as context; use a lab method for quantified biology
8. TerraProbe	Where do measured EC, moisture and temperature differ?	Portable tool / seconds	Persistent EC pattern or any pH/nutrient decision

Do not force a result
Some checks are unsuitable in dry, stony, cracked, frozen, saturated or recently disturbed soil. Record “not comparable” and return under better conditions. A skipped test is cheaper than a confident mistake.

1 Walk, look and map the pattern

The cheapest check is often the one done before digging.

BEST TIME	YOU NEED
After rain, during active growth and when symptoms are visible.	Phone or notebook, camera, map and a consistent route.
WHAT IT TELLS YOU	**TIME**
Whether the issue follows slope, soil type, traffic, water flow, stock concentration or management history.	10–30 minutes per paddock.

Walk from normal into abnormal

Start in an area performing as expected and walk into the affected area. Mark where the change begins. Look uphill and upstream as well as at the symptom itself.

- **Plant cover:** bare ground, uneven establishment, colour, vigour, species change or stock preference.
- **Water:** ponding, crusting, rills, sediment, wet patches, dry patches and run-on from tracks.
- **Traffic:** wheel marks, gateways, headlands, troughs, yards and repeated turning zones.
- **Surface:** cracking, sealing, loose sand, stones, salt crusts, dung and residue distribution.
- **History:** cultivation, grazing pressure, fire, earthworks, fertiliser bands, manure, lime or gypsum.

> **Good trigger for further work**
> If the same boundary appears in plant growth, surface condition and a soil check, map it as a separate investigation zone. That does not prove the cause; it tells you where paired samples or a soil pit may be worthwhile.

2 The spade check

Open the profile and let roots, pores and layers tell the story.

BEST TIME	YOU NEED
When soil is moist enough to dig without smearing or shattering.	Clean spade, tarp or tray, knife, tape measure, phone.
WHAT IT TELLS YOU	**TIME**
Structure, rooting depth, pores, colour, smell, moisture, layers and visible life.	5–15 minutes per point.

Method

- Dig a block at least one spade blade deep. Keep the top and orientation clear.
- Place it on a tarp. Ease it apart along natural fracture lines rather than crushing it.
- Compare aggregate size and shape, pore spaces, roots, colour, mottles, smell and moisture by depth.
- Repeat in a nearby normal area using the same depth.
- Photograph the face beside a ruler and point label.

What deserves attention

OBSERVATION	POSSIBLE QUESTION — NOT A DIAGNOSIS
Roots turn sideways at one depth	Is there a compacted, dense, acidic, saline, sodic or otherwise restrictive layer?
Grey colours or orange mottles	Is waterlogging or fluctuating aeration limiting roots?
Large plates or massive clods	Has compaction, wet working or structural decline reduced pores?
Rotten-egg or sour odour	Is the soil anaerobic? Avoid interpreting chemistry without analysis.
Few roots in an otherwise vigorous crop	Is the restriction physical, chemical, biological—or simply seasonal?

Escalate
Use a soil pit and professional interpretation where the limiting layer is below spade depth, the profile is unfamiliar, acid sulfate soil is possible, or a major earthworks, drainage or amelioration decision is being considered.

3 A simple infiltration check

Time how readily water enters—then compare zones, not internet scorecards.

BEST TIME	YOU NEED
Moist, unsaturated soil; avoid deep cracks and freshly cultivated ground.	PVC or steel ring, board, mallet, ruler, measured water, timer.
WHAT IT TELLS YOU	**TIME**
A comparative indication of water entry and surface structure.	Setup in minutes; drainage may take minutes to hours.

A repeatable paddock method

- Use a straight ring at least about 100 mm in diameter. Mark a consistent insertion depth.
- Trim vegetation without disturbing the soil. Drive the ring vertically at least 50 mm, using a board to protect the rim.
- Add the same depth or measured volume of clean water gently each time. A splash guard helps avoid sealing the surface.
- Start timing at the same water mark. Stop at the same end point.
- Run at least three repeats per zone and record cracks, ant holes, stones and initial moisture.

Optional calculation

If you time a known drop in water depth, an indicative rate is: **infiltration (mm/hour) = depth infiltrated (mm) × 60 ÷ minutes**. The number is method-dependent. Use it to compare your own repeated method, not as a universal soil-health grade.

Interpret in context
Sand, loam and clay naturally behave differently. Dry or water-repellent surfaces can also distort the first run. Persistent ponding may reflect surface sealing, compaction, a dense subsoil, sodicity, water repellence, topography or drainage—not one automatic fix.

4 Slake and dispersion check

Watch whether dry aggregates stay intact, fall apart or cloud the water.

BEST TIME	YOU NEED
Any time after representative aggregates have been air-dried.	Shallow clear dishes, rain or distilled water, pea-sized aggregates.
WHAT IT TELLS YOU	**TIME**
Aggregate stability and a field indication that dispersion may warrant laboratory follow-up.	Observe immediately, then again up to 20 hours.

Australian field method

- Collect intact soil from the surface layer and any suspect subsoil separately. Air-dry for several days.
- Place three 4–8 mm aggregates gently into 30–40 mm of rainwater or distilled water. Do not move the dish.
- Watch during the first minutes for **slaking**: the aggregate breaks into smaller pieces.
- Check later for **dispersion**: a fine milky halo or cloud forms as clay particles separate. Strong dispersion may appear quickly; check again after about 20 hours.
- Photograph matched samples together. Repeat before drawing a conclusion.

Slaking and dispersion are different

Slaking is breakdown during rapid wetting. Dispersion is the separation of clay into a fine suspension and is especially important in many Australian sodic soils. A soil can slake without dispersing.

Milky water is a laboratory trigger
Visible dispersion, surface crusting, poor infiltration or suspected sodicity warrants appropriate laboratory analysis, often including exchangeable cations and soil texture. Do not calculate gypsum or other amendment rates from a jar test.

5 Push-probe and penetrometer check

Feel where resistance changes and record the depth.

BEST TIME	YOU NEED
At comparable moisture—ideally moist, not saturated or bone dry.	Purpose-made push probe or penetrometer; depth marks; phone.
WHAT IT TELLS YOU	**TIME**
Relative resistance and the possible depth of a hard layer.	Seconds per insertion; many repeats are essential.

Method

- Confirm underground services and farm infrastructure before inserting any probe.
- Push vertically at a steady rate. Do not use body weight to force past an obstruction.
- Record the depth where resistance begins, peaks and eases. A sudden stop may be stone or root—move and repeat.
- Compare wheel track with inter-row, headland with paddock centre, and suspect zone with a local reference.
- Dig at representative points to confirm what the probe is contacting.

If using a gauged penetrometer

Use the manufacturer's cone, speed and method. Resistance rises as soil dries and varies with clay content, stones and roots. Compare like moisture, texture, depth and method. A pressure reading is context—not a ripping prescription.

> **Escalate before expensive intervention**
> A repeated hard layer at the same depth, supported by restricted roots or water movement, justifies a closer investigation. Confirm the cause and depth before deep ripping, controlled-traffic changes, drainage work or other high-cost action.

Record it in the TerraTactics farm portal

A penetrometer reading is most useful when it sits beside the same named GPS point as your TerraProbe screens. In TerraProbe Field Intelligence, open Compaction, enter depth and resistance in PSI or kPa, and save. The Grower portal keeps that test on the farm record with the soil sample — so next season you can compare gateway versus mid-paddock, or wheel track versus inter-row, at similar moisture instead of relying on memory.

- Name traffic lines honestly (gateway, header track) so they are never averaged mentally with representative paddock points.
- Note soil moisture. Resistance rises as the profile dries; a hard dry-day reading is not the same as a hard moist-day reading.
- A commonly cited root-restriction cue is around 2,000 kPa (about 300 psi) at comparable moisture. Treat it as a conversation starter, not a ripping trigger.

6 Roots, earthworms and visible soil life

Count what you can see, but respect climate, soil type and season.

BEST TIME	YOU NEED
When soil is moist and biologically active; repeat at the same season.	Spade, tray, ruler, moist container, hand lens if useful.
WHAT IT TELLS YOU	**TIME**
Visible roots and organisms under the conditions on that day.	About 10 minutes per hole.

A consistent count

- Dig a consistent block—such as 20 × 20 cm to a set depth—and place all soil on a tray.
- Break the block gently and count earthworms, roots and other visible organisms. Return organisms and soil to the hole.
- Repeat several holes per zone. Record soil moisture, temperature, ground cover and recent inputs.
- Compare the same soil type and season. Add a vegetated reference if it answers your question.

Earthworm numbers can vary greatly across Australian climates and soils. Low counts in dry, hot, sandy or naturally unsuitable conditions do not prove poor management. Ants, termites, dung beetles and other organisms may be more locally relevant.

Use absence as a question
If a moist, covered production site repeatedly has fewer visible organisms and roots than a nearby comparable site, review habitat, disturbance, chemistry and residue history. Use laboratory or specialist methods when a quantified biological claim matters.

7 Cotton-strip decomposition

A simple comparison of biological activity over several weeks.

BEST TIME	YOU NEED
Warm, moist conditions; avoid periods likely to dry out completely.	Identical unbleached cotton strips, scales optional, spade, labels.
WHAT IT TELLS YOU	**TIME**
Relative decomposition under the conditions during burial.	Minutes to install; retrieve after roughly 3–8 weeks.

Method

- Cut identical pieces of plain cotton. If weighing, dry and record the starting mass.
- Insert each strip vertically into a spade slit at the same depth, leaving a labelled end above ground.
- Install paired strips on the same day in the zones being compared.
- Dig strips out carefully rather than pulling. Photograph, gently clean and dry before any final weighing.
- Record burial duration, moisture and temperature conditions, and any damage from animals or machinery.

Faster loss can indicate more decomposition activity, but cotton is only one food source. Moisture, temperature, nitrogen supply, fabric treatment and soil contact all affect the result.

Do not call this a microbial biomass test
The cotton check is a low-cost comparative observation. If management or investment depends on quantified biological activity, discuss recognised laboratory options and sampling design with an appropriate adviser.

8 Portable screening with TerraProbe

Add measured field context and a GPS record between laboratory campaigns.

BEST TIME	YOU NEED
At consistent depth and comparable moisture; EC needs sufficiently moist soil.	TerraProbe Portable, Field Intelligence app and clean water/cloth for tool hygiene.
WHAT IT TELLS YOU	**TIME**
Measured moisture, electrical conductivity and soil temperature, plus clearly labelled indicative screens.	Seconds per point, with date and GPS saved.

What TerraProbe records

BASIS	INDICATORS	RESPONSIBLE USE
Measured directly	Moisture, electrical conductivity (EC) and temperature.	Compare repeated points at similar depth and moisture. EC is a lead about dissolved salts and field variation, not a complete salinity diagnosis.
Screened from EC	pH, nitrogen, phosphorus and potassium.	Indicative only. These are calculations from the same conductivity signal, so they move together and are not four independent measurements.

Where it can save time

- Revisit named GPS points after rain, grazing, harvest or a management change.
- Map where EC differs under comparable moisture and separate stable patterns from one-off readings.
- Use the record to choose targeted laboratory locations instead of guessing from convenience.
- Keep measured field context beside laboratory reports and paddock notes.
- Log penetrometer compaction at the same GPS points in the Field Intelligence app; the Grower portal stores those tests next to soil screens.

Non-negotiable limit
Never use TerraProbe’s screened pH, N, P or K as a fertiliser, lime or amendment rate. Use accredited laboratory testing and appropriate professional advice for decisions requiring nutrient, pH, salinity or sodicity values.

THE RESPONSIBLE NEXT STEP

When to stop checking and escalate

DIY checks are strongest at finding repeatable contrasts. They are weakest when a decision needs identity, concentration, rate, legal defensibility or diagnosis. Escalate when any of the following apply.

TRIGGER	NEXT STEP TO CONSIDER
Nutrient, lime or gypsum decision	Representative laboratory sampling using the correct depth, method and analysis suite; discuss interpretation and rates with a qualified adviser.
Persistent EC pattern, salt crust or poor growth	Laboratory salinity assessment appropriate to the soil and enterprise; review water quality and landscape position.
Dispersion, crusting or suspected sodicity	Exchangeable cations/ESP and texture as advised; do not infer gypsum requirement from EC or a jar alone.
Roots stop, mottling or waterlogging	Profile investigation to identify physical and chemical constraints; drainage and subsoil decisions need site-specific advice.
Potential contamination or off-site impact	Stop disturbance and seek suitably qualified environmental advice and compliant sampling.
Possible acid sulfate soil	Do not expose or disturb further. Follow state guidance and obtain specialist assessment.
Major spend or irreversible operation	Confirm the constraint, depth and likely response before earthworks, deep ripping or blanket amendment.

Build a chain of evidence
A sensible sequence is: paddock observation → repeatable field check → mapped zone → representative laboratory sample → local interpretation → management decision → revisit the same point. Not every question needs every step, but expensive decisions deserve more than one unverified indicator.

COST CONTROL WITHOUT FALSE ECONOMY

Turning observations into smarter spend

What a useful DIY check may help you avoid

- Treating one unusual point as representative of an entire paddock.
- Sampling wet and dry zones as though they were directly comparable.
- Ordering the wrong laboratory suite because the actual question was unclear.
- Applying a blanket intervention before confirming that the constraint is widespread.
- Repeating a field visit because the first observation had no GPS, depth or method notes.
- Losing previous results when staff, contractors or advisers change.

What it cannot safely save

- The laboratory test needed to establish pH, nutrients, salinity, sodicity, contamination or amendment requirement.
- Professional interpretation where several constraints can produce the same symptom.
- A proper sampling design when the result will drive significant expenditure or risk.
- Legal, environmental, food-safety or compliance testing.

The commercial value is the record
A cheap test repeated poorly creates noise. A modest set of named points, tested consistently and connected to laboratory results, can become more valuable each season because it shows what changed, where and under what conditions.

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One-page paddock worksheet

PADDOCK / POINT		DATE / TIME	
GPS / MAP PIN		DEPTH	
CROP / PASTURE		RECENT RAIN / IRRIGATION	

Conditions

SOIL MOISTURE	GROUND COVER	TRAFFIC / GRAZING	RECENT INPUTS

Checks completed

CHECK	RESULT / PHOTO ID	REPEATS	COMPARISON POINT
Paddock walk			
Spade profile			
Infiltration			
Slake / dispersion			
Probe / compaction			
Soil life			
Cotton strip			
TerraProbe			

What changed? What will we verify next?

PATTERN / QUESTION	NEXT CHECK, LAB SUITE OR PERSON	DUE

USE THE GUIDE RESPONSIBLY

Sources, attribution and important limits

Australian references used

- Agriculture Victoria / Victorian Resources Online, *How can I assess the health of my soil?* and *Assessing aggregate stability*.
- North Central Catchment Management Authority, *Soil Health Guide — Soil Carbon Edition* (2024).
- Landscape South Australia, Eyre Peninsula, *Rapid Assessment of Soil Health (RASH) Manual*.
- Soil Quality Knowledge Base, *How to test soil structure*.
- Australian Wine Research Institute, vineyard activity guidance for ring infiltration and on-farm soil assessment.
- Before You Dig Australia, safe planning around underground infrastructure.

Adapted source

This guide is an Australian adaptation drawing on Merfield, C. N. (2023), *DIY Soil Health Tests V1*, Report 01-2023, BHU Future Farming Centre, New Zealand. The source is licensed under Creative Commons Attribution–ShareAlike 4.0 International (CC BY-SA 4.0).

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Disclaimer

This guide provides general educational information only. Soil conditions, suitable methods and interpretations vary by soil type, climate, enterprise and jurisdiction. TerraTactics does not accept responsibility for decisions made from this guide. DIY observations and portable screening do not replace accredited laboratory analysis, site-specific professional advice, safe work procedures or legal and environmental obligations.

About TerraTactics
TerraTactics helps Australian farms keep paddock boundaries, GPS-tagged soil readings, field notes, laboratory reports and seasonal comparisons in one record. TerraProbe Portable measures moisture, EC and temperature and retains clearly labelled indicative pH/NPK screens. Learn more at terratactics.com.au.