

ACCURACY-FIRST ORGANIC FARM INTELLIGENCE

LivingShield AI Product Blueprint & Funding Brief

A field-ready plan for sensors, evidence, responsible AI and
an Australian founding-pilot programme.

Prevent pressure. Protect the living system.

Executive summary

LivingShield AI is an accuracy-first decision-support platform for organic farms. It brings soil and crop context, trap observations, weather, field checks and adviser review into a zone-level prevention workflow.

It is not: an autonomous sprayer, a pest diagnosis tool, a substitute for agronomists, a replacement for laboratory soil analysis, or an organic certification system.

It is: a way to see changing conditions earlier, direct field attention to the right zone, select the least-harmful next step with the right people, and preserve a usable evidence trail.

Product question	LivingShield answer
What is the core product?	A zone-level prevention operating system: observe, verify, intervene carefully, record and review.
Why use sensors?	To provide continuous context on root-zone and microclimate conditions between field visits. They do not replace field checks or laboratory soil analysis.
Where does AI fit?	First in quality checks, explainable rules and anomaly detection. Predictive machine learning follows only after labelled pilot outcomes and independent evaluation.
What is the key value?	A clearer, reviewable path from condition to human decision, not a black-box score.

The operating principle

Technology observes. Growers and experts decide. Each significant signal shows its source, freshness, confidence, uncertainty and recommended verification step.

1. Product structure

The product is designed as six connected layers. Each layer preserves context instead of flattening the farm into a single “risk” number.

Layer	What it contains	Why it matters for accuracy
1. Field capture	Soil probes, weather context, pest traps, photos, irrigation records and scout observations.	A reading is only useful when its source and location are known.
2. Data foundation	Timestamp, device ID, zone, depth, data freshness and quality status.	Makes it possible to distinguish a field change from poor data.
3. Quality control	Range, rate-of-change, missing-data and flatline checks; cross-checks with weather and irrigation.	Prevents low-quality data becoming a confident alert.
4. Zone intelligence	Explainable thresholds, seasonal trends, anomaly detection and comparison with a zone baseline.	Finds change without claiming a diagnosis.
5. Human workflow	Field task, photo/note, adviser escalation, action and follow-up review.	Turns a signal into accountable verification.
6. Evidence layer	Organic Crop Passport: observation, decision logic, action and outcome review.	Creates an audit-friendly record; it does not certify organic status.

Recommended founding-pilot hardware stack

A practical pilot uses low-maintenance components supplied by specialist partners: multi-depth soil moisture and temperature probes; a local weather source where regional weather is insufficient; a low-power gateway or cellular connection; selected pest traps; and a mobile field-check workflow. Hardware should remain replaceable and vendor-agnostic where possible.

2. Sensor design: how many and where?

There is no credible fixed answer such as “one sensor every 100 metres.” A sensor is placed to represent a management zone, not a geometric grid. Final positions require a site survey, soil profile review and agronomist/irrigation input.

A management zone changes when soil texture or depth, topography, drainage, crop variety, canopy, irrigation set or management practice changes materially. Begin by mapping these zones, then use one representative station per zone. Add a second station when a zone contains a meaningful wet/dry, upper/lower-slope or high/low-vigour contrast.

Placement rule

Place the station in a representative active-root location. Avoid wheel tracks, headlands, emitters, field edges and unusual wet spots unless that exact anomaly is deliberately being monitored. Select sensor depths from the crop root profile and validate soil contact at installation.

Illustrative scenario	Starting layout	Important limitation
5 ha uniform irrigated block	1 soil station, 1 local weather source, 1-2 trap positions.	Only appropriate after confirming similar soil, irrigation and crop behaviour.
20 ha farm with 4 zones	4-6 soil stations, 1 weather station, 4-8 trap positions.	Add stations when the zones contain meaningful internal variation.
20 ha farm with strong slope/soil variation	6-8 soil stations, 1 weather station, targeted trap positions.	May start with fewer instrumented zones in a learning pilot.

Distance guidance: use distance only as a practical installation constraint after zones are defined. It is not the decision rule. A station 50 m away may be unrepresentative; one 300 m away can be representative if soil, crop and irrigation behaviour are the same.

3. The accuracy protocol

Accuracy is treated as an operating discipline. The product should be trusted only to the level its evidence supports.

Stage	Required practice	Output
Baseline	Map zones, crop stage, soil profile, irrigation layout and relevant soil laboratory results. Capture starting photos and farm question.	A known starting condition.
Install	Record device ID, location, depth, soil contact and installer check. Validate readings after irrigation/rainfall.	A traceable field asset.
Validate	Detect missing, implausible, flatline and sudden-jump data. Compare with irrigation and weather context.	A quality status on every signal.
Alert	Show source, freshness, confidence, uncertainty and what must be inspected next.	A verification task - not automatic action.
Review	Grower/adviser confirms, rejects or annotates the finding and records the follow-up.	Labelled learning data and accountability.
Model release	Evaluate on held-out farm data by crop and region. Report false alerts, missed events, precision and recall.	Evidence before predictive deployment.

Confidence states

Green - observe: fresh, plausible data and no material deviation. **Amber - verify:** a meaningful change or incomplete evidence; assign a field check. **Red - escalate:** multiple corroborating signals or a crop-risk condition; route to the grower/adviser. No state triggers an automatic treatment.

4. How AI works - and when it should not

The right AI method depends on the maturity of the farm data. LivingShield should start with methods that are inspectable and safe, then earn the right to become more predictive.

Method	When to use it	Role in LivingShield	Accuracy guardrail
Explainable rules	Day one	Thresholds, data-quality checks, rate of change and prevention workflow.	Every rule is visible and editable with expert review.
Anomaly detection	After clean seasonal history	Find readings or patterns that differ from a zone baseline.	An anomaly creates a check task, not a diagnosis.
Computer vision assist	After labelled images	Help organise photos or identify visual similarity for human review.	No pest or disease claim without verified labels and review.
Supervised predictive ML	After multiple labelled pilot seasons	Estimate risk pattern for a defined crop, region and outcome.	Evaluate by farm/season; report false positives and misses before release.

Why AI is needed

Farm data arrives too often, from different sources, and at different scales for a person to continuously compare unaided. AI helps quality-check, combine context, identify change and prioritise where people look next. It must not remove agronomic judgement or hide uncertainty.

5. Pilot design and indicative cost

A pilot should prove the decision workflow and data discipline before it tries to prove broad biological or financial outcomes. All figures below are planning ranges in Australian dollars, not quotes or live supplier pricing.

Pilot element	Indicative range	What it covers
Lean proof-of-concept	A\$1.5k - A\$3.5k	Limited sensor/trap access, manual observations, simple dashboard and workflow test.
Credible 90-day farm pilot	A\$8k - A\$15k per farm	Site survey, selected field hardware, installation, data setup, adviser review, onboarding and end-of-pilot report.
Advanced validation programme	A\$20k - A\$50k+ per farm	More zones, stronger coverage, research design, integration and multi-season evaluation.

Illustrative A\$10,000 founding-pilot allocation

Category	Share	Purpose
Field hardware, install and connectivity	35%	Sensors, gateway/weather source, site work and maintenance allowance.
Product and data platform	25%	Zone model, ingest, quality controls, dashboard and Crop Passport prototype.
Agronomy and research review	20%	Baseline, protocol, field review and evaluation.
Responsible AI and security	10%	Data governance, model evaluation, alert logic and incident process.
Onboarding and operations	10%	Grower training, field workflow and pilot reporting.

6. Funding case and milestones

Funding should purchase de-risking evidence. It should not be used to manufacture a scale story before the farm workflow is validated.

Stage	Illustrative capital need	Evidence required before moving forward
Product and partner design	A\$25k - A\$75k	Signed pilot design, hardware partners, data governance, install protocol and usable prototype.
Founding-pilot programme	A\$250k - A\$400k	6-10 structured pilots, stable data capture, evidence completion, grower/adviser workflow adoption and transparent pilot learning.
Scale programme	Set only after validation	Repeatable installation, retention, unit economics and independently reviewed outcome evidence.

A serious investor story

The investable asset is a trusted operating system for prevention decisions - not sensor resale. The moat emerges from a clean zone model, workflow adoption, high-quality labelled farm evidence, trusted advisers and crop-specific validation. The disciplined sequence is: pilot the workflow, validate accuracy, quantify value, then scale by crop and region.

7. Real-world hardware and product deployment

LivingShield integrates commercially available field hardware. The product value is the governed installation, data quality and decision workflow - not a claim to have invented every sensor component.

Component	What it does in a founding pilot	Build / operating note
Multi-depth soil probe	Measures root-zone moisture and temperature at selected crop depths.	Weather-sealed sensing elements, cable, logger and exact depth/location record. Validate soil contact at install.
Weather source	Adds rainfall, temperature, humidity and other locally relevant context.	Use an existing reliable local source or an on-farm station after a coverage and maintenance review.
Gateway or cellular modem	Moves low-volume field readings to the platform.	Choose after a coverage survey. Store readings during short outages and report stale data.
Power	Keeps field devices operating.	Battery or solar is sized for shading, interval, device draw and service access.
Trap / scout observation	Adds pest activity and field evidence to the zone record.	Trap activity creates a scout task; it does not prove a pest outbreak or trigger treatment.

Indicative per-farm equipment approach

A four-zone pilot may start with 4-6 multi-depth soil stations, one weather source, one gateway/cellular connection and 4-8 targeted trap positions. Final quantities and placement follow a site survey of soil, crop, irrigation, slope, communications and field access. There is no valid universal “one sensor every X metres” rule.

How the workflow works in the field

Survey zones, install and calibrate, capture baseline, monitor signals, quality-check the data, create a defined field check, have the grower/adviser decide, record the action and re-check the outcome. This is the practical farm loop that LivingShield must prove before it scales.

8. Mission, roadmap and market position

The company needs a clear purpose and a realistic path to earning a place alongside existing agricultural technology.

Mission

Help organic growers and their advisers see changing farm conditions earlier, verify what matters in the field and choose the least-harmful next step with a clear record of why.

Vision

A food system where farm decisions are supported by timely evidence, healthy soils and biological knowledge - not broad intervention, disconnected dashboards or false certainty.

18-month gated roadmap

Timing	Decision gate	Deliverable
Months 0-3	Design partner and technical survey	Farm question, zone map, supplier shortlist, governance, bill of materials and pilot protocol.
Months 3-6	Founding pilot installation	1-2 farms, validated data quality, trained field team and observe-verify-record workflow.
Months 6-12	Multi-farm evidence	6-10 structured pilots, labelled outcomes, adoption measures and product iteration.
Months 12-18	Controlled expansion decision	Independent review of reliability, unit economics, outcome evidence and early model performance.

Where LivingShield is unique - if it proves it

Soil sensors, weather tools, irrigation platforms, trap systems and farm-management software already exist. LivingShield should integrate with that ecosystem, not pretend it replaces it. Its proposition is the missing decision-and-evidence layer: source-aware signals, confidence before action, adviser escalation, least-harmful prevention logic and an exportable decision record. This is a product thesis, not a verified performance claim.

9. Governance and next steps

LivingShield is in development. This brief describes a product and pilot blueprint, not current operational capability or measured results.

Minimum governance commitments

1. Grower-controlled data access and export. 2. Clear ownership and retention terms. 3. Human override on all recommendations. 4. Product and certification boundaries shown in the interface. 5. Incident review for poor data or unsafe recommendations. 6. External soil, crop, pest, irrigation and responsible-AI input before high-consequence use.

First 90-day pilot sequence

Weeks 0-2: farm question, zone map, soil/irrigation profile and baseline. **Weeks 2-3:** hardware install, calibration checks and workflow onboarding. **Weeks 3-11:** monitor, field-check, record prevention actions and adviser review. **Weeks 12-13:** data audit, grower review, evidence report and decision on next season.

Sources and planning note

This concept brief uses the general principle that soil-monitoring devices must be selected, installed and interpreted for crop, soil and irrigation context; it should be reviewed against supplier specifications and site-specific expert advice before deployment. Reference starting points: Agriculture Victoria guidance on soil-moisture monitoring and agtech demonstration projects; CSIRO digital-agriculture material; and LivingShield pilot planning assumptions. Hardware counts and cost figures are explicitly indicative as at October 2026 and require supplier quotes.

LivingShield AI | Australian organic-farm intelligence | “Technology observes. Growers and experts decide.”