



FABRICADEMY
textile and technology academy

She Who Holds The Ground

Amber O' Kelly

What is the project about?

Roots

- A root-grown wearable armour, Inspired by land goddesses, not warfare.
- Formed from land systems, Grown from roots, moisture, and time.
- Listens through bio-electrical signals
- Protects through connection, not violence



Diana Scherer



Why roots?

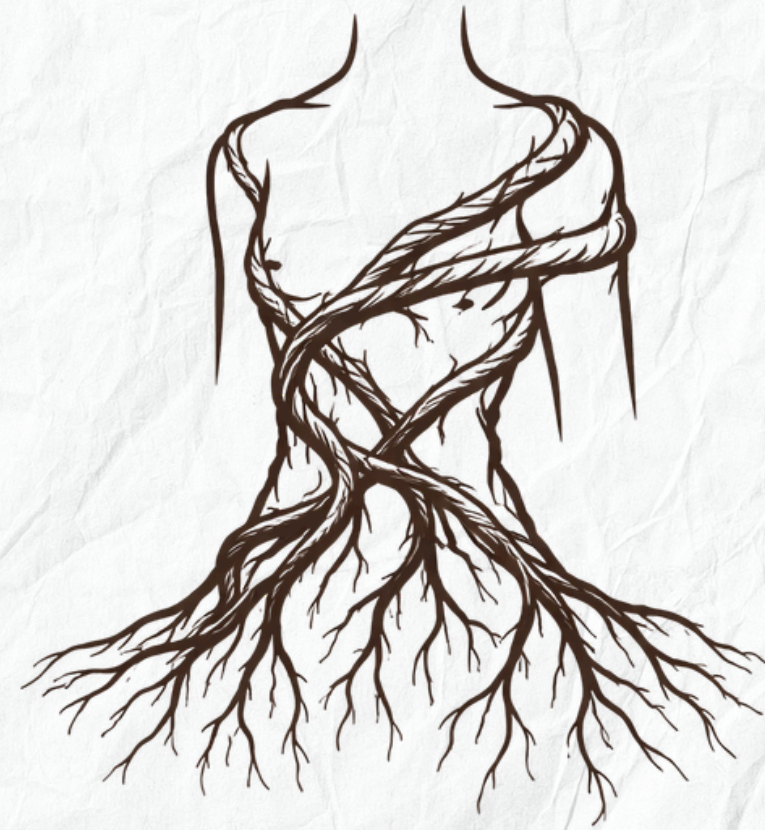
As a material ;

- Roots are a living, regenerative material
- Form grows through care, not extraction
- Strength emerges through entanglement
- Design becomes hosting, not control



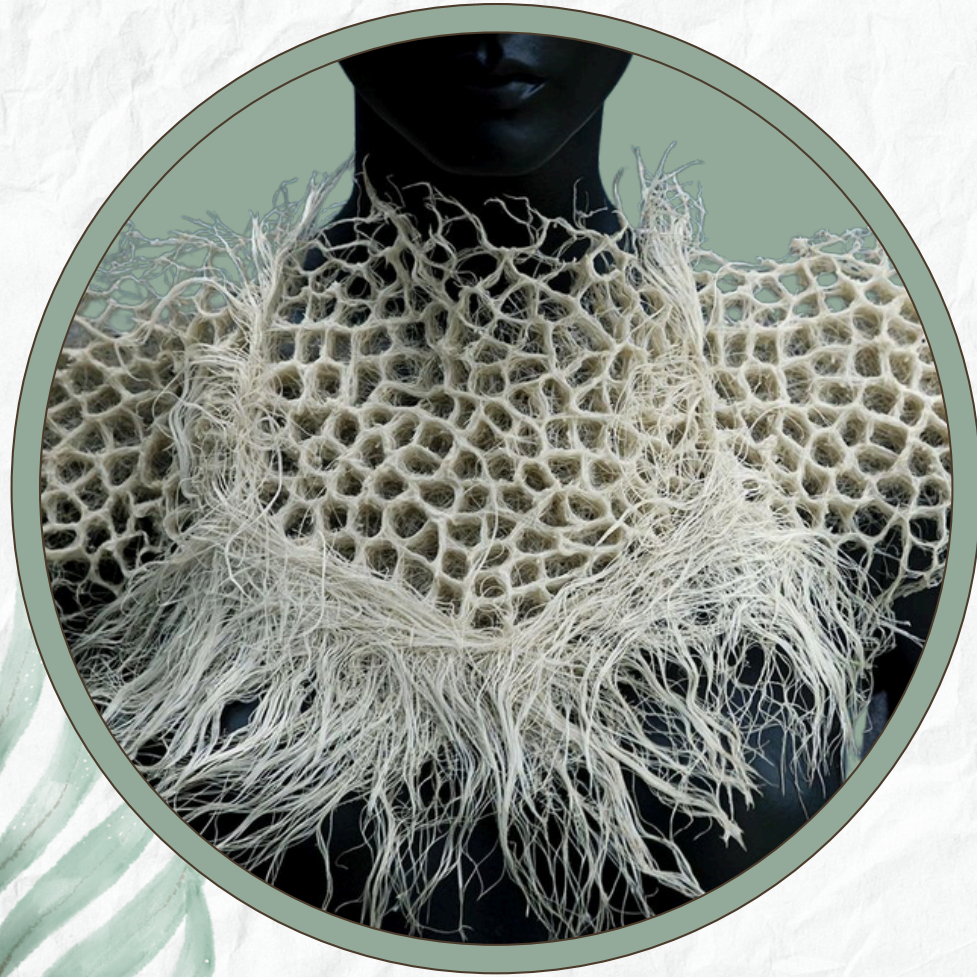
Cultural ;

- Land as relationship, not resource
- Knowledge formed through care and time
- Roots model interdependence
- Armour as connection, not separation



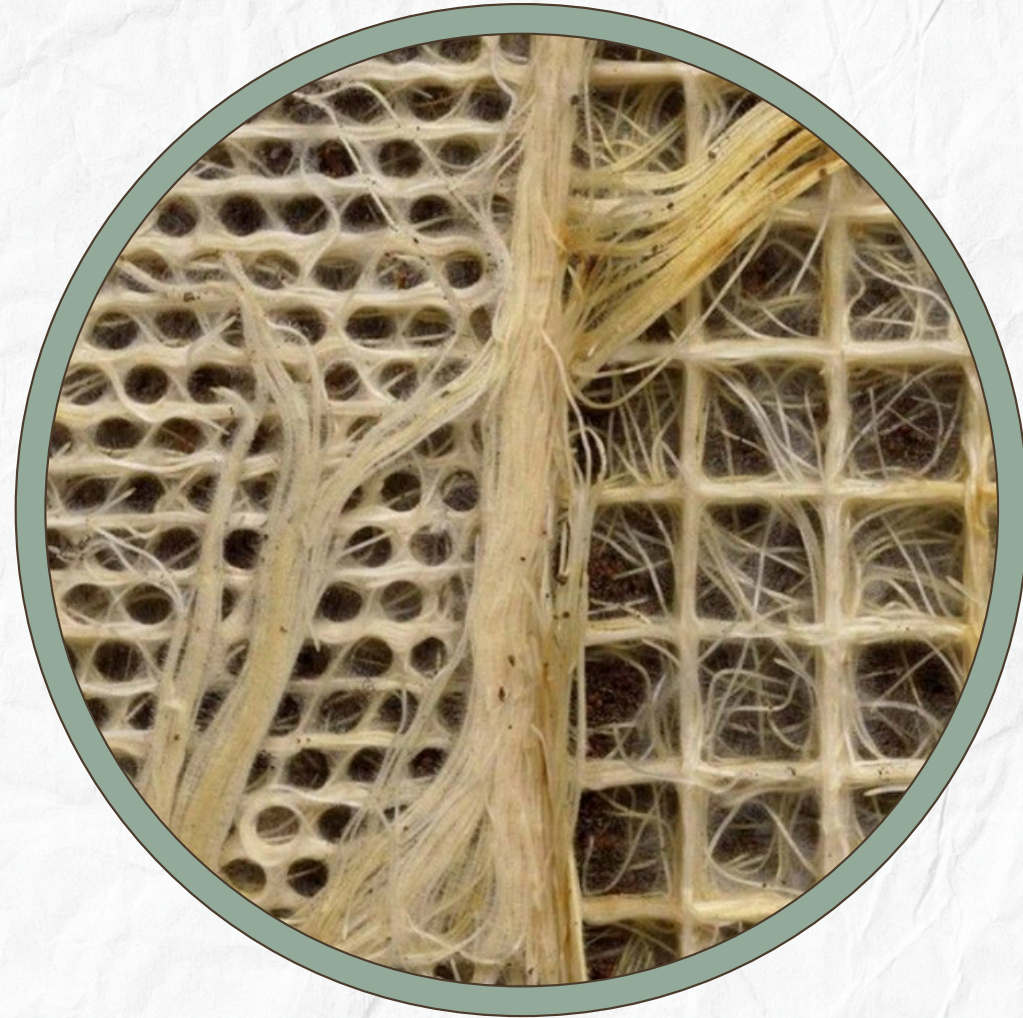
Rosana Paulino

Inspirations



Zena Holloway

Works with roots of the wheatgrass plant



Diana Scherer

Works with the roots of wheat & oats



Barbara Rakovska

Works with the roots Amber Grain

Roots as material, not metaphor

Roots naturally do what we try to engineer by binding loose matter into a solid structure, gaining strength through interconnected networks

Each outcome is expressive and unrepeatable. Growth records time, care, and environment. Variation becomes material intelligence, not error

Regenerative by default

- Low energy (light, water, time)
- Zero waste, compostable end-of-life
- Participates in ecological cycles rather than extracting from them

Design shifts from control → collaboration

The final object is not manufactured; it is grown.

The work asks: What if design didn't dominate nature, but listened to it?



Zena Holloway

Biodesign Approach: Fabricating Textiles Through Growth

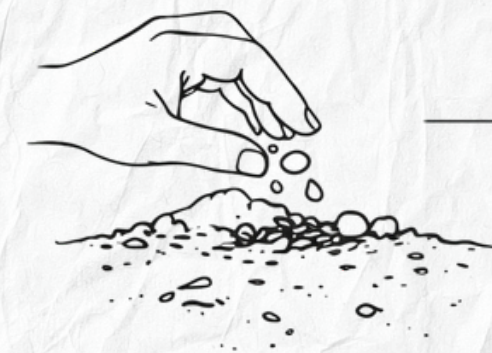
Seeds placed in the ground
Material potential activated

Hosting Conditions
Meshes · lattices · moulds
Frameworks guide, not force

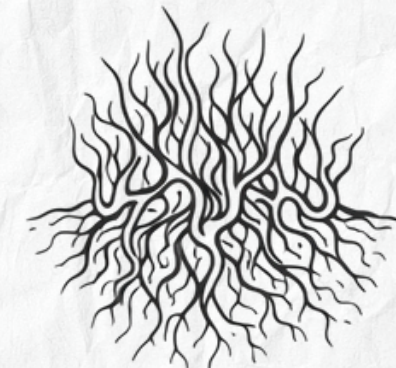
Growth
Roots search, bind, thicken
Structure forms through movement

Formation
Surface and structure merge
Strength emerges from entanglement

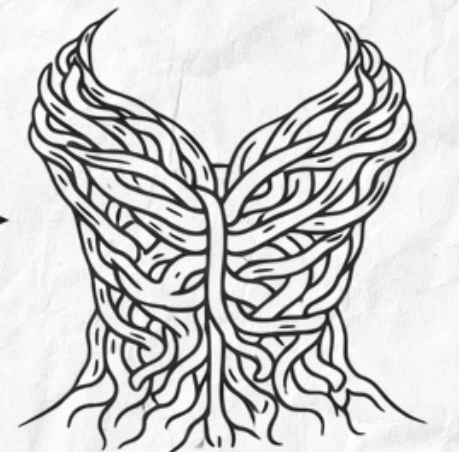
Pause
Growth slowed and stabilised
Material state held in time



Planting seeds

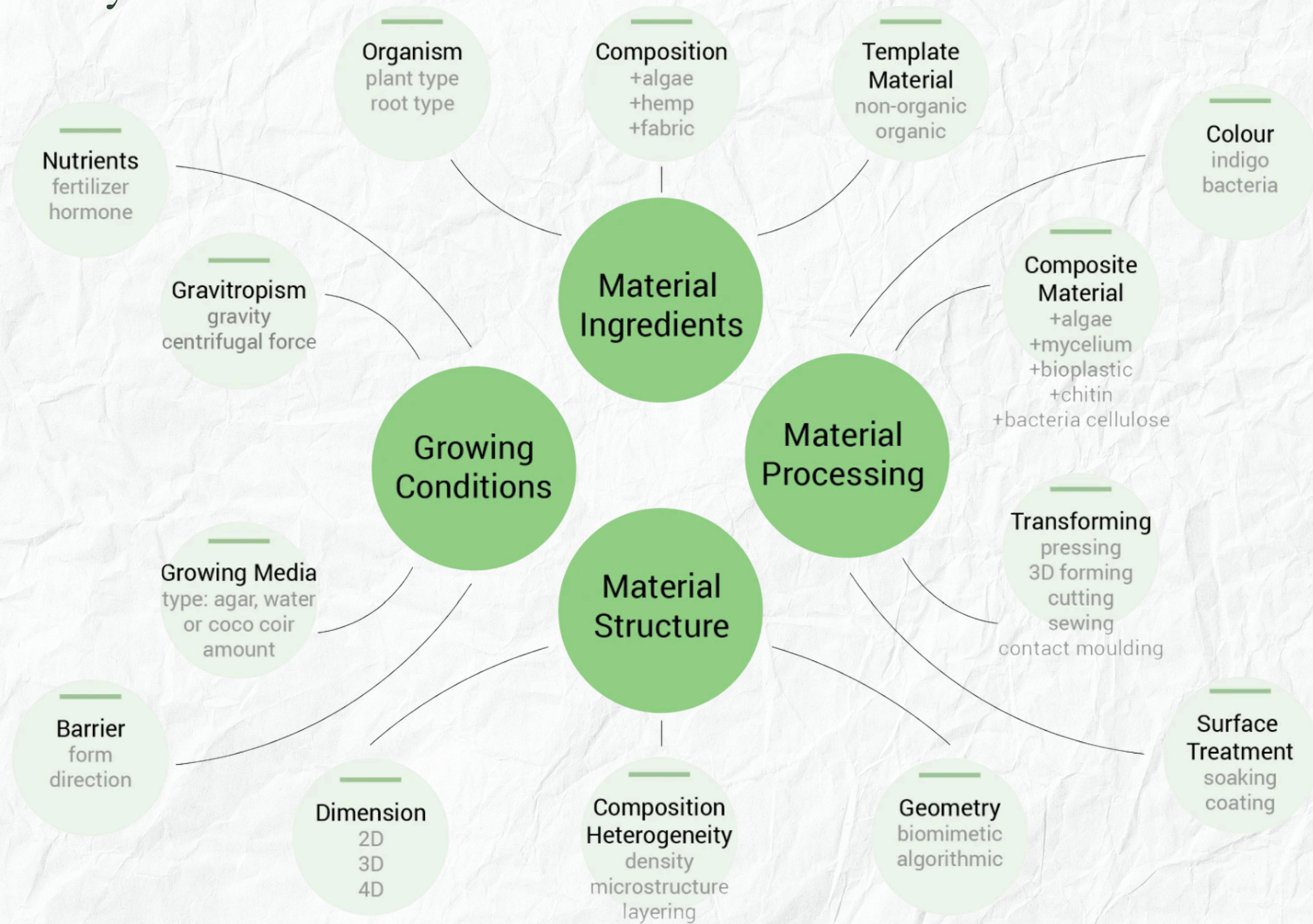


Roots are growing and interlocking



Root-based organic armour

Material System Overview



Taxonomy to support tinkering activities with plant roots

Zhou, J., Barati, B., Wu, J., Scherer, D., & Karana, E. (2020). Digital biofabrication to realise the potentials of plant roots for product design.

Beyond roots: exploring the aerial layer

In addition to wheatgrass root systems, I experimented with chia and flax seeds to investigate their behaviour as surface-growing materials.

Unlike structural root mats, these seeds:

- Germinate rapidly with only water
- Adhere naturally to fabric due to their gel coating
- Grow directly on textiles without soil
- Create a living, aerial layer rather than a dense structural base

What this revealed

- Textiles can act as growth substrates, not just support structures
- Adhesion can occur biologically, without stitching or glue

This experiment shifts the focus from root-binding to plant-fabric symbiosis, where growth itself becomes the attachment mechanism.



The motions of wheatgrass

Seed germination after rinsing twice a day for 2 days. By Day 3, the seeds are ready to be planted.



Day 1



Day 2



Day 3



Roots aftering 10 days growth



Active elongating root systems



Overgrowing substrate

Trying to understand
the brain of the
wheatgrass



GROWING ARMOUR | Land, Body & Biofabrication

The process of cultivating root textiles has led me to combine living systems, digital fabrication, and Irish land-based symbolism.

I aim to create a contemporary biofabricated bodice where structure, pattern, and meaning are grown together through guided root development.

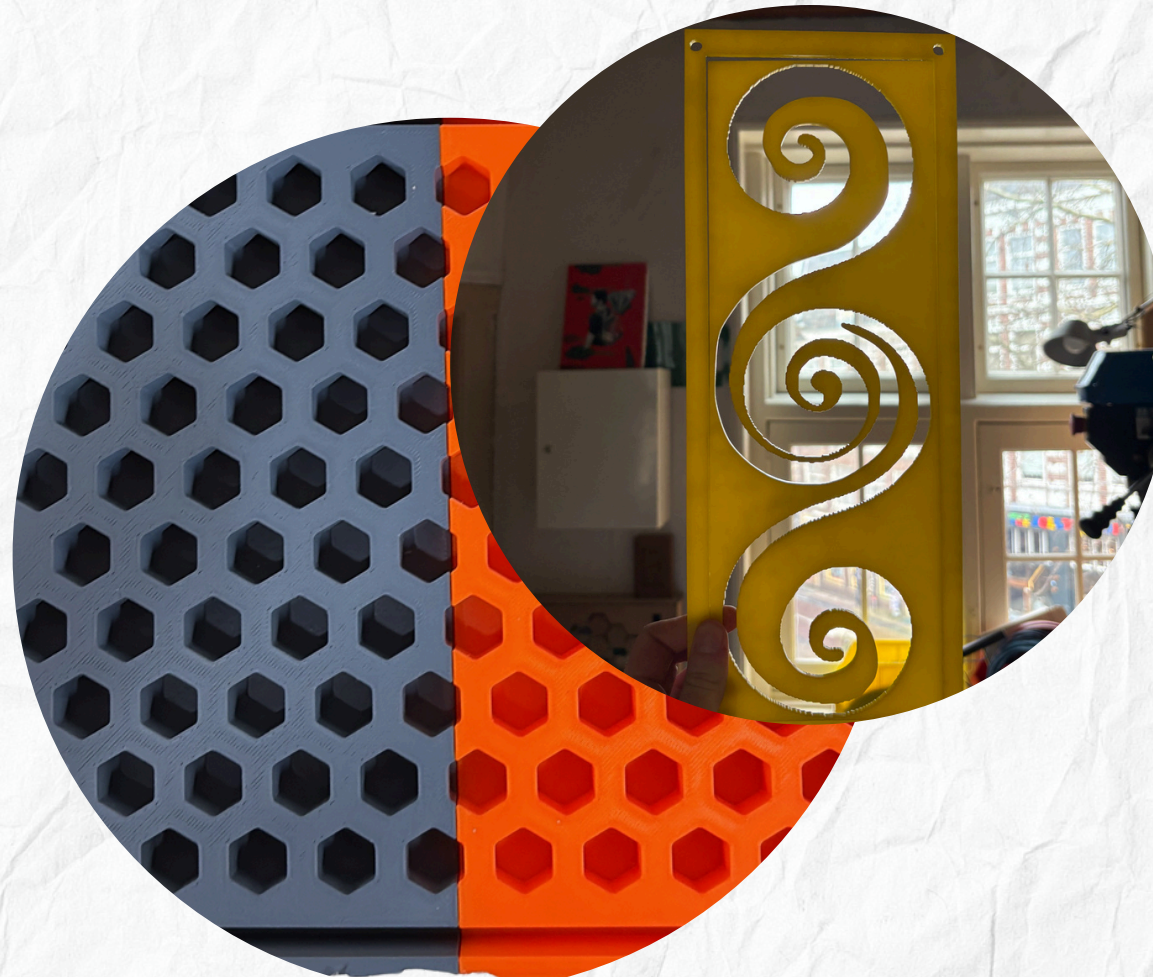


IRISH LAND GEOMETRY
Land as pattern language

Spiral motifs

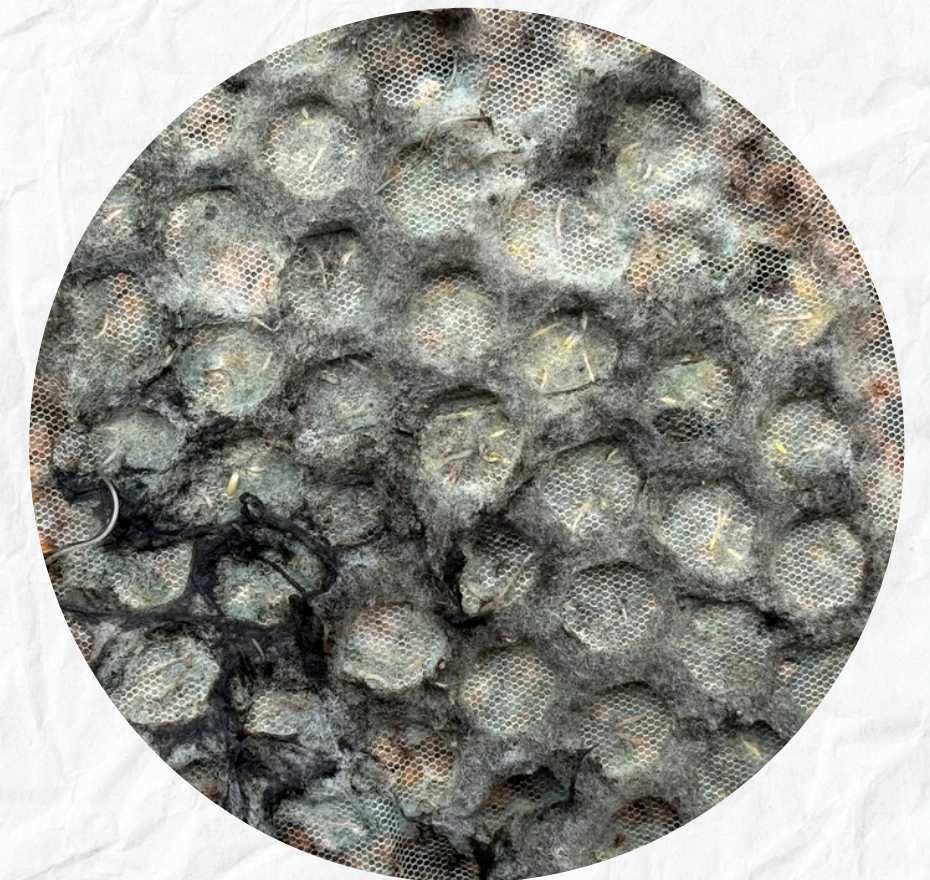


Giant's Causeway hexagons.
A rich natural tapestry



DIGITAL FABRICATION

Parametric hexagon frameworks
Geometry as growth guide



ROOT-GROWN
STRUCTURE
Living textile formation

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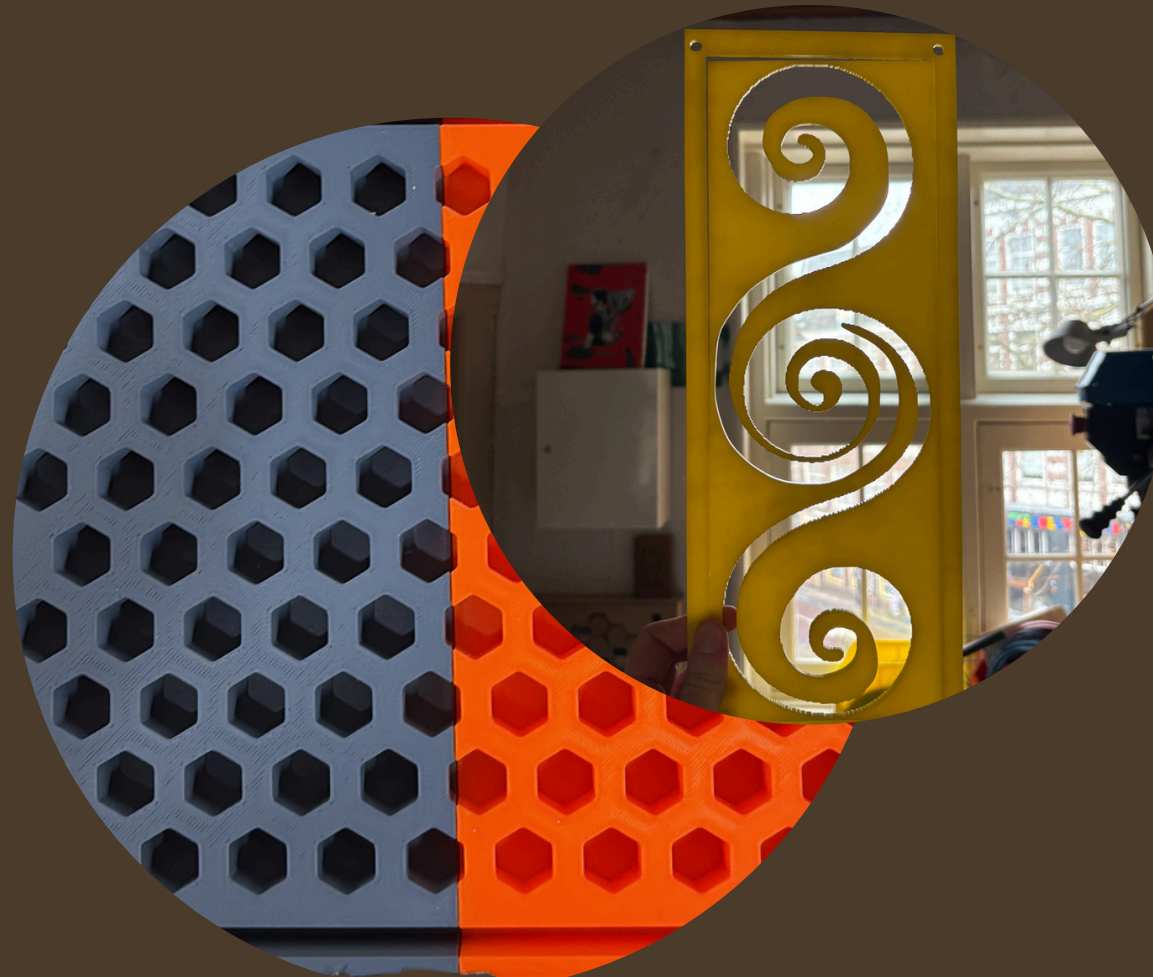


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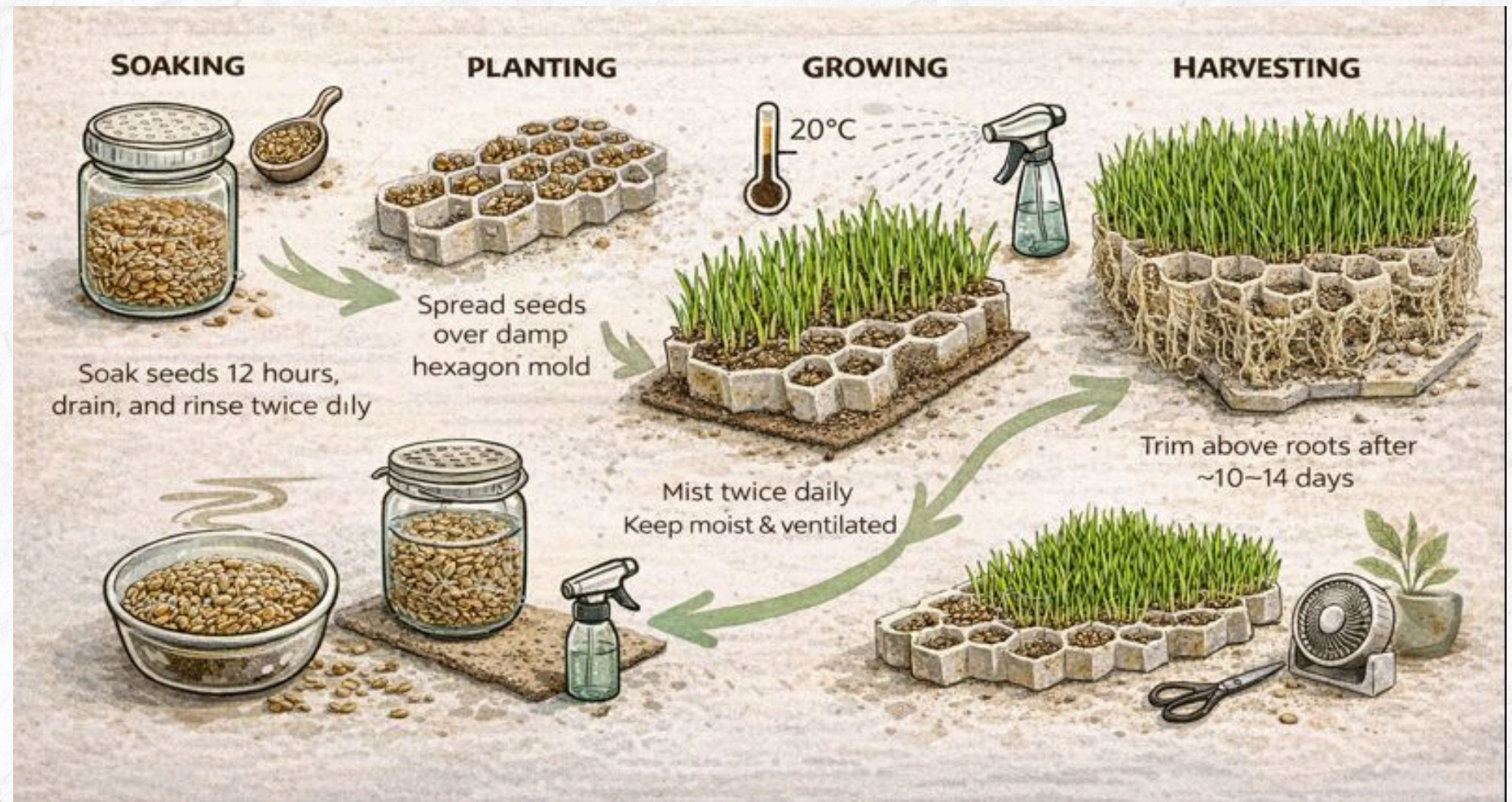
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ROOT-GROWN
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How the armour will be made

The roots will grow on moulds, growing on a fabric bodice shape. After harvesting, the roots will be air-dried and cured in a non-polluting way. Panels are connected using hand stitching.



Cut bodice

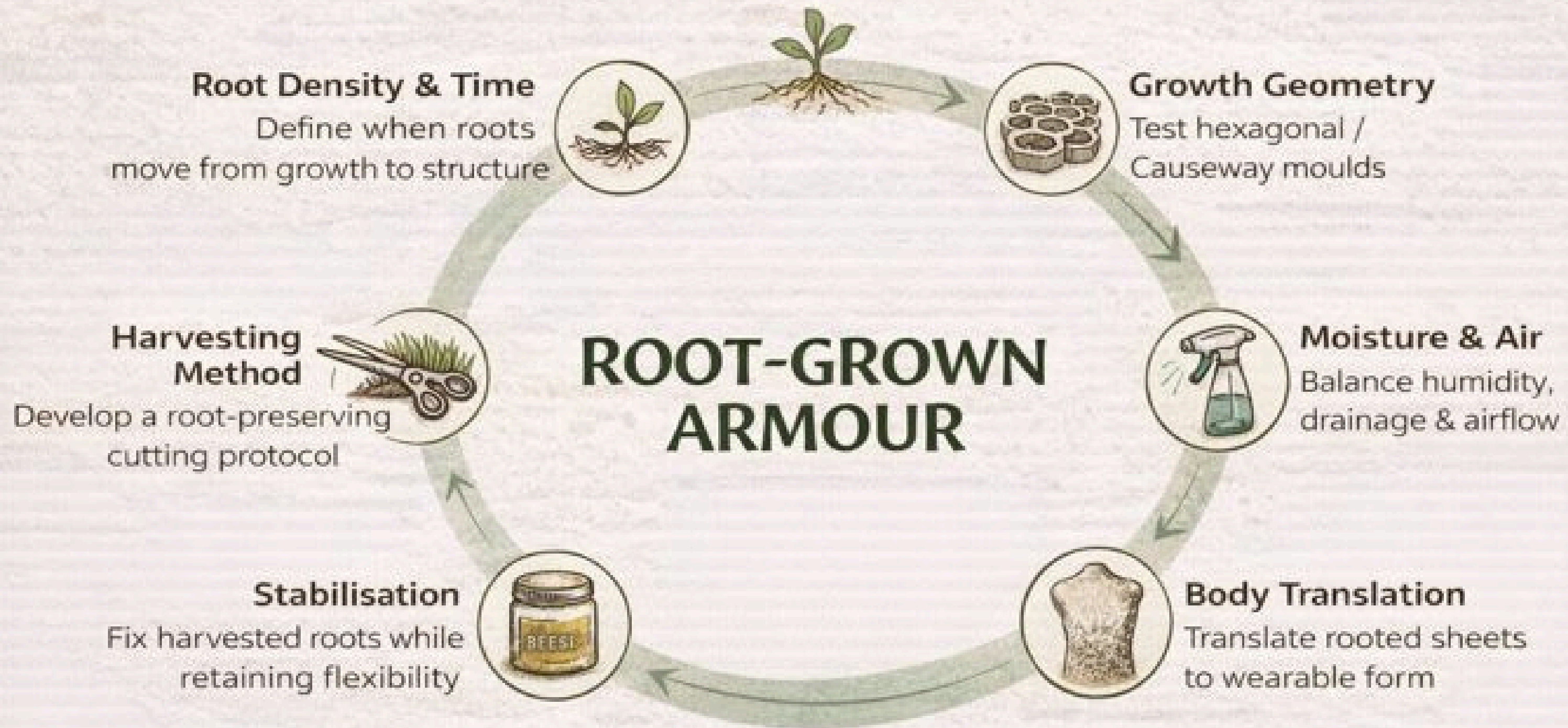


Mold



Frames &

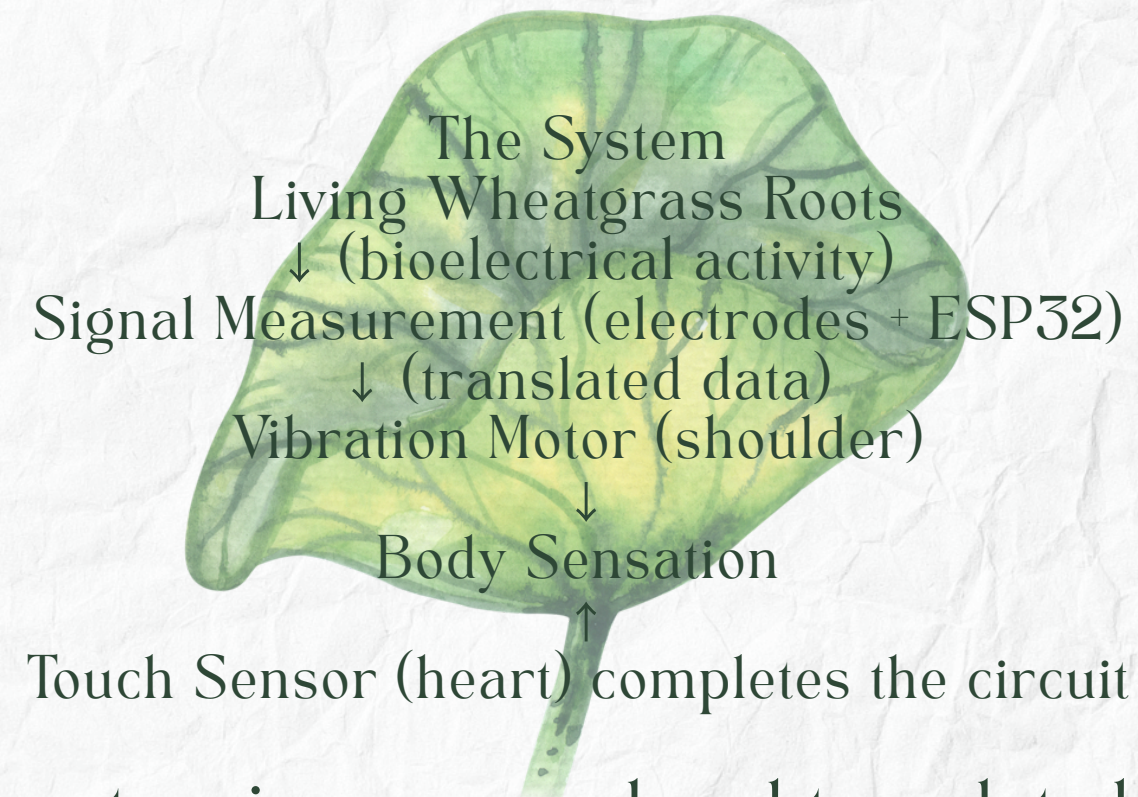
Next Steps: Refining Conditions



The aim is not to control the material, but to create the conditions in which structure can emerge.

Living Circuit: Root → Body → Ground

A wearable system where the land is not observed, it is felt.



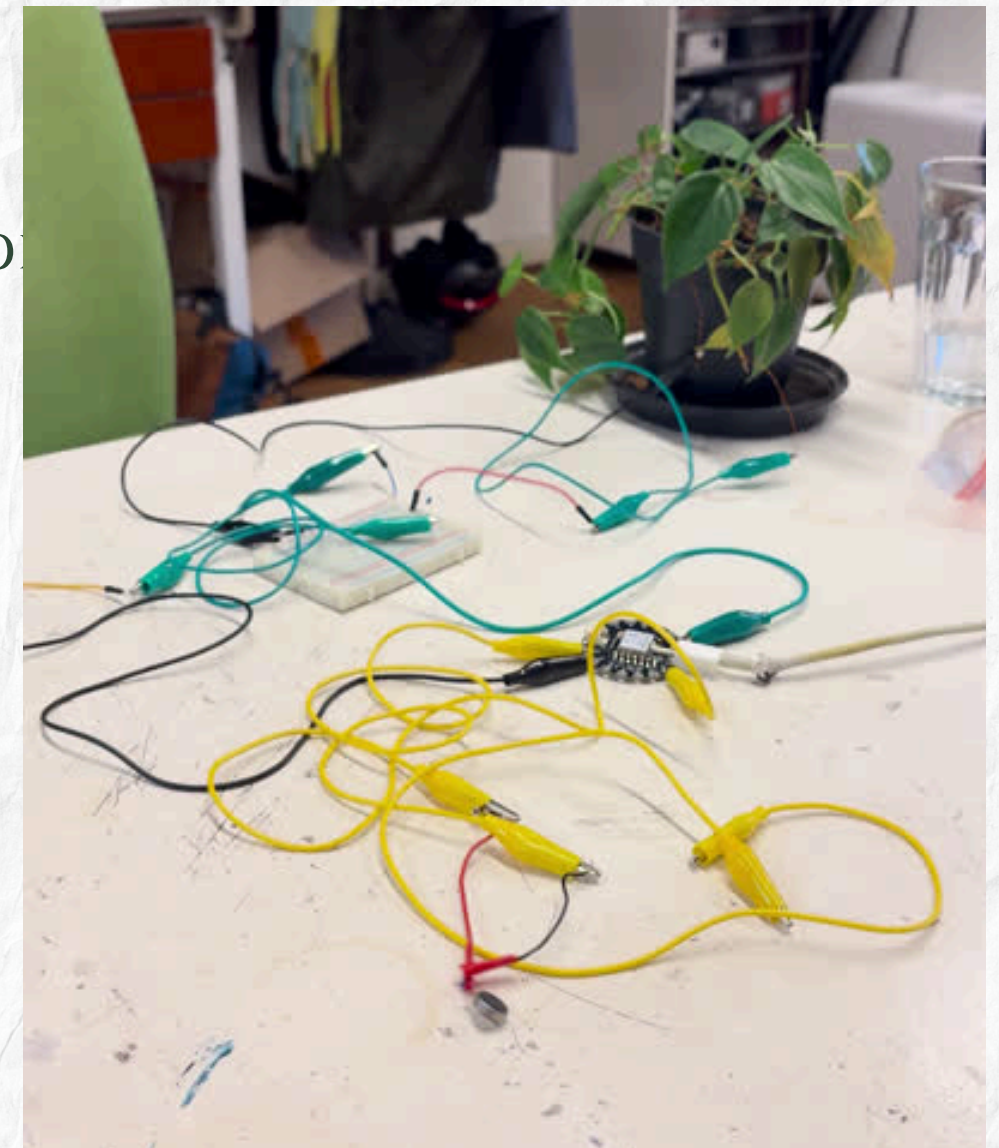
What Is Happening?

The electrical activity of a living root system is measured and translated into vibration. When the wearer places their hand on their heart, the circuit activates. The body feels the rhythm of the plant.

Why?

Modern life disconnects us from soil and ground.

If we cannot go to the ground, the ground comes to us. Grounding becomes a living feedback loop between land and body. The plant regulates the rhythm. The human chooses to connect.



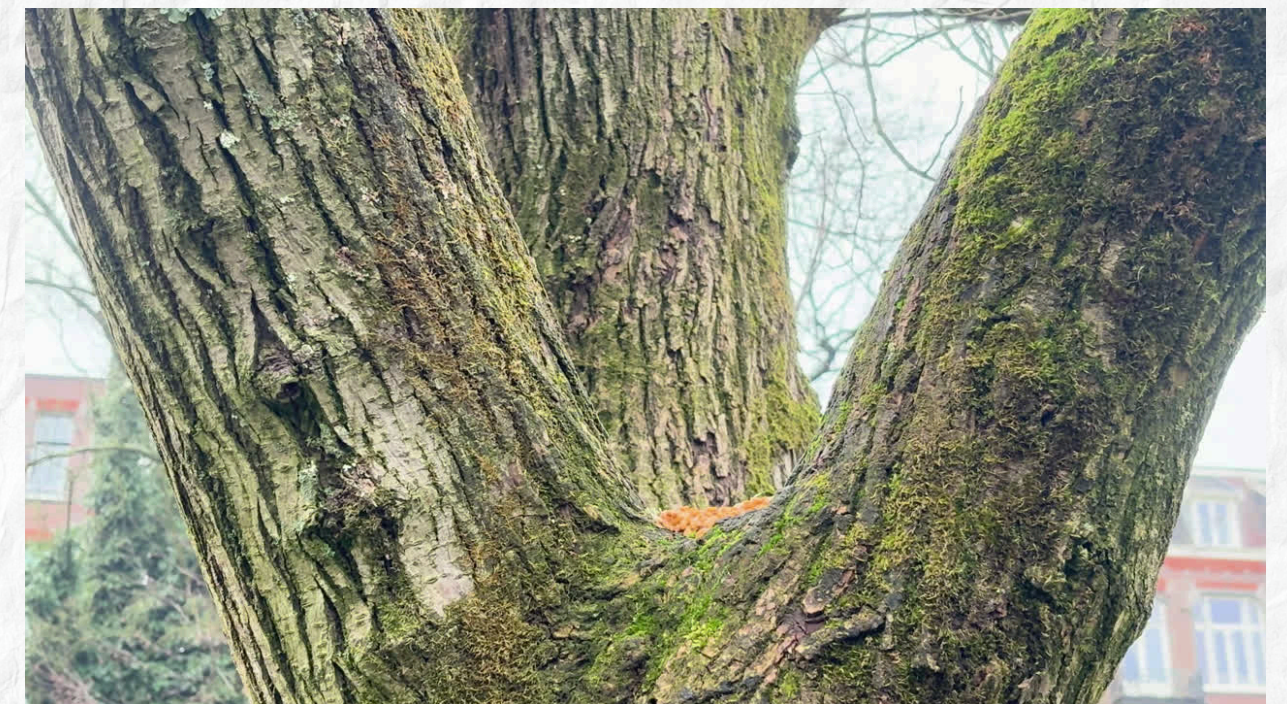
Grounding Becomes Behaviour

I planted seeds outside.
In parks.
In garden soil.
In the ground that already holds life.

I planted them inside my house.
And returned to them every day.
Grounding became behaviour.

The land sets the pace.
Not me.

Hosting growth changed my design process.
I adjusted my routine.
I slowed down.
I responded instead of controlling.
The project stopped being about fabrication. And became
about the relationship.



Grounding is not symbolic. It requires care, repetition, and presence.

Reuse

- Experimenting with surplus grass to create a secondary biomaterial
- Grass fibres explored through weaving and binding, particularly in the bust area
- Extends the material life beyond roots by using the whole plant system
- Biomaterial panels can hold vibration components and soft electronics
- Waste becomes structure, not residue



& return

- Experimenting with moss as a living host to break down wool
- Moss is a bryophyte: it retains moisture, regulates temperature, and supports microbial life
- Wool (keratin-based fibre) does not degrade through force, but through sustained biological conditions
- Moss can create a stable micro-climate where bacteria and fungi slowly weaken keratin
- Decomposition happens through hosting, not destruction





Thank you