Food & Soil: Living Soil Sheets and Guild Agriculture — Executive Summary

A field-manifesto for modular living soils, guild agriculture, and community kitchens

Purpose & Vision

A practical, measurable path to urban/regional food resilience using Living Soil Sheets (LSS) and Guild Agriculture. Thin, modular soil horizons (2–15 cm) host plant–microbe–insect teams that convert light, water, and minerals into nutritious food—on rooftops, balconies, courtyards, and elevated walkways. The goal is not just yield, but repairable systems, justice-first kitchens, and a steward economy where learning compounds.

First Principles

- Soil is a system, not a substance.
- Modularity is a promise to maintain: if it can be lifted, it can be healed.
- Guilds win because relationships outperform parts.
- Beauty is evidence: leaves that glow, flavors that ring, soils that smell alive.

Living Soil Sheets (LSS)

Architecture: biofibers + mineral fines + humic films with tuned porosity/capillarity. Pre-colonized with mycorrhizae and compost biology; quick-latch edges, hydronic coils, and drip/film ports. Activation SOPs hydrate gently, ramp temperature, and plant into slits—no coring. Sheets are measurable, healable, and renewable (re-sheet or compost at end-of-life).

Microbiome as Infrastructure

Bacteria–fungi–archaea are treated as hired talent: nitrifiers, denitrifiers, P-solubilizers, mycorrhizae, decomposers. Onboard in stages; monitor lightly (respiration, ORP, EC) with occasional amplicon snapshots. Disturb gently to prevent crusts; rebuild guilds after shocks with targeted inoculation and rest. Ethics: provenance, quarantine, and no wild release.

Guild Agriculture

Design teams, not rows: leafy speedsters, calorie staples, mineral accumulators, nitrogen fixers, companions. Stack vertical/temporal layers; mosaics diversify root depths and interrupt pests. Coordinate weekly menus with harvest rhythms; prune/trellis for airflow; tune light recipes by guild.

Water & Nutrient Loops

Closed loop: source → fertigation → root zone → capture → plant-polish → remineralize → source. Choose drip/film/ebb-flow by sheet geometry. Keep EC modest; prevent salt creep with pulses/flushes. Plant-polish wetlands lift DO and strip nutrients; sanitize with heat/UV, not harsh chemicals.

Light, Heat, and Root-Zone Ecology

COLORVISION coordinates spectrum, intensity, and heat with circadian logic. Hybrid LED with strategic HPS/MH provides photons plus gentle radiant heat 24/7/365. Maintain canopy vs root-zone bands, VPD gradients, and storm-mode for grid dips.

Biosecurity & Resilience

Vestibules, quarantine racks on separate loops, escalation ladders, and allowed biocontrols. Redundancy via duplicate guilds, standby sheets, and gravity-feed fallbacks. Disaster drills are rehearsed; succession scripts rest/reset tired beds.

Economics & Governance

Cost-at-cost pricing tiles show farm cost, steward share, and community margin; fair wages with paid learning blocks; reinvestment into kitchens and compost loops. Compliance is posted (food safety, worker safety, electrical/plumbing, compost permits). Plastic-free incident playbooks on fiber cards; material passports and reverse logistics keep the loop circular.

Replication & Education

Pilot charter with stop/scale gates; kit-of-parts; commissioning that bows to biology. Scale 1→3→9 with shared hubs (seed, ferment, QA) and mutual aid. Open SOP library (CC BY-SA), modular education (Soil You Can Touch, Ferment Lab, Sensor Saturday), stipended apprenticeships, and school pipelines.

Proof, KPIs & Covenant

Publish wall-legible metrics: kcal & kg/m²/day, MDI, water/energy per kg, °C-hours within band, EC drift, healthy-bed uptime, plate-waste <5%, labor hours/kg, refurbishment rates, replication cost curves. Close with the Covenant of Plenty: Proof-of-plenty, No-dead-dirt, Open patterns, Steward economy, Iteration heartbeat.