Johnny Autoseed

Business Plan

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> ***"No one should have to choose between food and rent."***

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Waste In. Value Out. Community Stronger.

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1 Executive Summary

Johnny Autoseed is building a waste-to-value platform rooted in Butte County, California, with a model designed to scale to any city. We intercept two kinds of waste that communities generate every day: organic waste from restaurants and food processors, and land waste in the form of underutilized residential lawn. Lawns consume water, produce nothing edible, and cost property owners money to maintain. We convert both waste streams into productive local infrastructure.

On the food waste side: plate scraps, spent grain, and food processing byproducts are sterilized and used as feedstock for semi-automated algae cultivation. FarmBot Genesis XL manages photobioreactors around the clock. The output is high-protein biomass, bioplastic precursors, and biofuel feedstock, materials the local economy needs, produced from inputs that currently cost money to manage.

On the land waste side: the Yard-to-Yield program advises property owners converting underutilized residential turf into productive growing surfaces. We analyze their options, navigate the regulatory and rebate landscape, and hand them a plan, plus a researched (not vetted, not negotiated) list of contractors who might be a fit, so they can build drought-resilient, water-efficient yards, food-producing gardens, native pollinator habitat, or a blend of both. The yield belongs to the property owner, who makes every hiring decision. Trimmings, spent biomass, and organic leftovers feed the algae system. Nothing leaves the loop.

Together, these two tracks form a closed-loop, regenerative local economy. The technology behind this model is not experimental. Industrial algae cultivation, open-source agricultural robotics, and controlled-environment food production are mature industries in East Asia, Europe, and parts of the Middle East. Johnny Autoseed brings these proven systems to Butte County first, with the intention of publishing the full open-source playbook so any community can replicate the model.

> ***"A system that gets stronger every time a new participant joins."***

HOW THIS ACTUALLY GETS BUILT: ONE RUNG AT A TIME

Everything above describes where this goes, not what it does this week. Johnny Autoseed is built as a ladder, and the plan is to climb it in order rather than to announce the top of it and hope the middle fills in.

1. Rung 1, today: information, analysis, and education. Research, property assessments, written plans, rebate navigation, and free community workshops. Nothing is manufactured, installed, or fulfilled. This is where the business is right now.
2. Rung 2, next: simple, legal, above-ground builds. Planter boxes, raised beds, garden enhancements. Unattached, non-structural, no permit, nothing that touches plumbing, gas, or electrical.
3. Rung 3, with traction: larger installations and managed systems. Full yard conversions and automated growing systems, which need licensing, insurance, and staff that revenue and grants have to pay for first.
4. Rung 4, the plan above: the closed loop at community scale. Restaurant feedstock, algae production, and the SACSA distribution network.

Each rung opens when three things are true at once: demand has proven itself on the rung below, the people and equipment exist to deliver it, and the legal path has been checked for the specific jurisdiction. Rungs are not skipped because a grant arrives. Section 4 sets out the ladder in full.

Phase 1 Pilot: Butte County / Chico, CA

- Yard-to-Yield: advise and support property owners converting residential turf to productive growing surfaces or native pollinator habitat; reduce water consumption, build drought resilience, and restore local biodiversity
- Restaurant partnerships: collect and divert plate scraps from 20 local restaurants as algae feedstock
- Closed loop: excess plant matter from yard conversions feeds photobioreactors alongside restaurant waste
- FarmBot Genesis XL manages photobioreactors: pH, nutrients, light cycles, harvest triggers
- Local AI (edge hardware) analyzes production data to refine cycles and reduce costs
- Primary outputs: high-protein biomass (animal feed + human nutrition), bioplastic precursors
- SACSA network: build community participation infrastructure for distributed food production and local distribution
- Phase 1 goal: validate both the land-conversion advisory track and the waste-to-algae pipeline simultaneously

Current Status: July 2026

- Entity formed: Johnny Autoseed LLC is registered and can receive grants, sign contracts, and open business accounts. It is also the parent entity for the founder's other operating brands, so one set of books now carries every venture
- Web presence live and staffed: johnnyautoseed.com carries 21 published posts, a services menu, an events page, a public research library, and this business plan. A phone number is published on the site and the primary call to action is a phone call, not a checkout
- Planning groundwork done: this plan supersedes a 39-page v1.5 proposal covering system architecture, budget, and the SACSA cooperative model
- Working model of the system: Solarpunk Farm Sim v0.0.5 is a playable simulation of a SACSA node, live at johnnyautoseed.com/sim, showing the full loop in one artifact (see Technology Stack)
- Funding path scoped: seven grant programs identified and applications in preparation; a scanner tracks new solicitations automatically (see Funding Strategy)
- Pilot relationships targeted: Recology Butte Colusa, Cal Water, Chico State, Butte College, and the Butte County Food Bank

The entity and the groundwork are in place. Phase 1 is execution and validation, not formation.

2 Problem & Opportunity

The US generates 80 million tons of food waste per year. The vast majority goes to landfill, where it decomposes anaerobically and generates methane, a greenhouse gas 28× more potent than CO2. Restaurants alone account for roughly 40 billion pounds of that waste annually.

According to the ReFED U.S. Food Waste Pact Data Report 2025, grocery retail alone generated 3.98 million tons of unsold food in 2024, representing $26.9 billion in lost sales. That single sector produced 16.44 million metric tons of CO2-equivalent emissions, equal to running 3.8 million cars for a year. And 21% of it still went straight to landfill. This waste contains exactly what algae need to grow: nitrogen, phosphorus, and carbon.

> ***"We are literally paying to haul away our own fuel."***

Metric	Value
US food waste per year	80 million tons
Retail lost sales from unsold food (2024)	$26.9 billion
Methane's warming power vs. CO2	28×
Of retail unsold food still sent to landfill (2024)	21%

California's SB 1383 (Short-Lived Climate Pollutant Organic Waste Reductions) took effect January 1, 2022 and requires all businesses and residents to divert organic material from landfill. Jurisdictions began levying penalties on non-compliant generators in 2024. Restaurants are now legally required to find alternatives to landfill. Johnny Autoseed's feedstock collection model positions us as a SB 1383 compliance solution, not just an agricultural business.

The Second Waste Stream: Land

Residential lawns are a liability masquerading as an amenity. The average American lawn produces nothing edible, nothing sellable, and nothing that sequesters carbon at meaningful rates, yet it consumes significant water and ongoing maintenance cost. In California, maintaining turf grass is an increasingly expensive commitment. Cal Water and similar agencies have introduced per-square-foot rebate programs to incentivize turf removal, but most eligible homeowners have not acted. The administrative path is opaque and hard to navigate alone.

Metric	Value
Acres of residential lawn in the US	~40 million (the single largest irrigated crop)
Residential water use in CA going to outdoor irrigation	50%+
Revenue generated by the average residential lawn	$0
Water savings possible by replacing turf with food-producing landscape	75%

> ***"The gap is not technology. The gap is knowing what your options are."***

3 Solution: Waste In, Value Out

Instead of treating food waste as a disposal problem, we treat it as a feedstock. Plate scraps and organic byproducts from restaurants are sterilized and processed to provide the nitrogen, phosphorus, and carbon that algae need to grow rapidly in photobioreactors. FarmBot Genesis XL manages the photobioreactors: monitoring pH and nutrients, adjusting dosing, triggering harvests, and logging everything. Local AI running on edge hardware ingests that data and identifies patterns: which conditions drive yield, where costs can be cut, when to switch species or outputs. The system refines itself automatically over each production cycle.

The Loop

Stage	Description
Input: Food Waste	Plate scraps, spent grain, and food processing byproducts from local restaurants. Currently a disposal liability. For us, free feedstock rich in the nutrients algae consume.
Process: Automated Cultivation	FarmBot manages photobioreactors around the clock. pH, nutrient dosing, light cycles, temperature, and harvest triggers run as scheduled Lua sequences with no full-time operator required.

Stage	Description
Optimization: Local AI	Edge AI analyzes production logs cycle over cycle, surfacing insights and adjusting parameters. Over time yields improve and costs fall without manual intervention.
Output: Materials + Food	Bioplastic precursors, biofuel feedstock, high-protein biomass for animal and human nutrition, and textile-grade material. Output mix shifts based on species selection and downstream partnerships.

What FarmBot Manages

- Nutrient dosing via peristaltic pump (ml-level precision)
- pH adjustment via bicarbonate injection
- LED grow light cycles (adjustable photoperiod)
- Harvest trigger via optical density sensor
- Temperature monitoring and alert
- Data logging to InfluxDB + Grafana

OPEN SOURCE BY DESIGN

Hardware designs, cultivation sequences, and protocols are published under MIT / Creative Commons license. Our competitive advantage is local execution and community relationships, not IP. Technology that can help communities become more self-sufficient belongs to everyone.

4 The Ramp-Up Engine: Advisory Services

Before the first algae system is running and before the first grant lands, the business generates revenue using expertise the founder already has: navigating water rebates, local regulations, and residential food production in Butte County. Advisory services are Phase 1's cash engine. They pay for equipment, extend runway, and build the community relationships the whole operation depends on.

The Capability Ladder

The single most common way a venture like this fails is by promising the top of the ladder while standing on the bottom rung. Johnny Autoseed is structured to avoid that. Capability is added one rung at a time, and each rung has to earn the next.

Rung	What we do	What opens it	Status
1. Information	Research, analysis, education. Property assessments, written plans, rebate navigation, regulatory research, free community workshops. Nothing tangible is produced or installed	Nothing. This is the floor, and it is already running	LIVE TODAY
2. Simple builds	Simple, legal, above-ground work: planter boxes, raised beds, trellises, garden enhancements. Unattached and non-structural, no permit required, nothing touching plumbing, gas, or electrical	Proven advisory demand, a per-jurisdiction legal check, insurance, and a scope that fits the minor-work exemption or a license	Next rung, not yet offered
3. Installations	Full yard conversions, irrigation, automated growing systems installed for clients	Licensing, staff, insurance at scale, and the revenue or grant funding to carry all three	Planned
4. The closed loop	Restaurant feedstock diversion, algae production at volume, SACSA community distribution	Everything above, plus facilities, permits, and a team	The plan in this document

Two things are worth saying plainly about this table. The first is that the ladder describes client-facing capability. Research, prototyping, and cultivation on property Johnny Autoseed controls run in parallel from day one, because building a bench system on your own bench is not a service offered to anyone. That own-site work is precisely what makes rung 2 and rung 3 credible when they open.

The second is that rung 2 is genuinely narrow, and calling it narrow is the point. In California, the minor-work exemption at BPC §7048 was raised from $500 to $1,000 by AB 2622 effective January 2025, and the Contractors State License Board adjusts that figure for inflation annually beginning January 2026. It applies only when the work needs no building permit and no workers are hired to help, and an unlicensed person advertising such work has to say so. The current-year amount and the specific project's permit status get confirmed before anything is quoted. A business cannot live on that exemption alone, which is exactly why rung 2 is a rung and not a destination.

FREE WORKSHOPS AND COMMUNITY EVENTS

Johnny Autoseed hosts free events, online and in-person, covering water rebates, lawn conversion, local food production, and pollinator/native habitat gardens. These are not just marketing, they are the community-building work that makes everything else possible. Attendees who want to go deeper become Track A clients.

Track A: Yard-to-Yield Conversion

Most homeowners who want to convert their lawn to food production get stuck at the same place: the Cal Water rebate program requires pre-approval, a Letter to Proceed, and rebate-compliant contractors. The process is manageable but unfamiliar. Johnny Autoseed is the trusted friend who has done it before and will help you get it done.

Track A now serves two conversion paths with the same process and the same tiers: Yard-to-Food (raised beds, edible landscaping, backyard production) and Yard-to-Pollinator (California native plants and pollinator habitat). The Cal Water rebate's plant requirements are built around low-water California natives, at least half the converted area must be planted with approved low-water, climate-appropriate species, which makes a native pollinator garden the most rebate-natural conversion available. Blended designs use natives to satisfy the rebate requirement and food beds in the remaining area. Plant selection draws on the Xerces Society's California pollinator plant lists and Cal Water's approved-plant database.

Tier	Price	What You Get
Tier 1: Property Potential Plan	$50	On-site property walkthrough and square-footage assessment, rebate eligibility review, personalized breakdown of options (food production, pollinator/native habitat, or a blend). No contractor list at this tier: it is a "what your property could do" plan, not a build-ready blueprint.
Tier 2: Application & Plan Assembly	$175	Everything in Tier 1, plus rebate application paperwork assembled ready for your filing, a detailed site plan, and a researched contractor list (informational only: not vetted, not affiliated, not negotiated on your behalf). You review, submit, and make first contact yourself.
Tier 3: Full Project Completion Support (ON HOLD)	$365	Not offered. The project-coordination model requires a CSLB license or an HIS registration under a licensed partner, so this tier is withheld pending that decision. See Risk Analysis.
Tier 4: Custom Site Advising	Quoted	Research and advisory on semi-autonomous growing tools, vendor evaluation, custom infrastructure planning.

Operator Economics & Fee Model

Service	Price	Founder delivers	Freelancer (~$20/hr)
Track A: Tier 1 Property Potential Plan	$50 flat	~$50	~$20
Track A: Tier 2 Application & Plan Assembly	$175 flat	~$175	~$88
Track A: Tier 3 Full Project Completion Support (on hold)	$365 flat	~$365	~$332

Service	Price	Founder delivers	Freelancer (~$20/hr)
Additional advisory / research (project basis)	$30–75/hr	~$30–75/hr	~$6–45/hr

Delegation and Scaling

The founder delivers all services directly in Phase 1 to establish client relationships, validate each tier, and document the process. Once a tier is proven, delivery shifts to trained operators: Fiverr specialists, VA services, and part-time contractors. The founder's attention then moves to algae R&D, technology development, and grant applications.

THE LONG-TERM PLAY

The advisory portfolio is not the destination, it is the bridge. Revenue from advisory services funds Phase 1 algae operations. The community relationships built through Track A seed both the feedstock supply chain and the showcase property network. The consulting work and the core mission are not parallel tracks. They reinforce each other.

5 Go-to-Market & Phase 1 Milestones

> ***"The first showcase property is the whole strategy. Everything after it is a referral."***

Free workshops (online and in-person) are the zero-cost lead engine for both the restaurant and lawn advisory tracks. A restaurant owner who attends a workshop on SB 1383 compliance becomes a warm call. A homeowner who attends a water-rebate session is a qualified Tier 1 prospect.

The First 90 Days

1. Month 1: Open business accounts and secure insurance; sign the first restaurant diversion pilot; deliver the first $50 property potential plan; build the first bench-scale photobioreactor.
2. Month 2: Host the first free community workshop; convert the first lawn client; log the first harvest data from the bench system; deliver the first paid advisory engagement.
3. Month 3: Complete the first showcase property; open the first school partnership conversation; publish the SACSA node simulation as a public proof artifact; submit the first grant applications.

Phase 1 Milestones and KPIs

Quarter	Milestone	Measurable KPI
Q1	Entity and infrastructure live	4 photobioreactors operational; 5 restaurant conversations opened; first Tier 1 session delivered; SACSA node simulation published

Quarter	Milestone	Measurable KPI
Q2	First revenue across both streams	5 restaurant partners signed; 3 Tier 1 sessions completed; first harvest logged; first workshop hosted; grant application pipeline tracking every open program
Q3	Validation and delegation	10 restaurant partners; 2 lawn conversions; first advisory track delegated to an operator; 3 grants submitted; rung 2 legal review complete for Butte County
Q4	Scale-ready	20 restaurant partners; first school partnership signed; 12 months runway proven; Phase 2 grant pipeline active; first simple above-ground build delivered if the rung 2 review cleared

6 Species Selection: Spirulina First

Property	Spirulina	Chlorella	Beef
Protein % dry weight	60–70%	45–60%	26%
Water per gram protein	0.5L	0.8L	112L
Land per gram protein	0.5 sq ft	0.6 sq ft	164 sq ft
Contamination resistance	High (alkaline pH)	Low	N/A
Harvest ease	Easy (mesh filter)	Complex (centrifuge)	N/A
Retail price / lb	$30–70	$20–60	$5–15

Growth Parameters

Parameter	Value	Parameter	Value
pH	8.5–10.5	Photoperiod	12–16 hours
Temperature	30–38°C optimal	Harvest cycle	Every 2–3 days
Light intensity	2,500–10,000 lux	Yield (closed PBR)	2–5 g/L/day
Salinity (NaHCO3)	16–20 g/L	CO2 fixation rate	~1.8 g CO2/g biomass

Spirulina's alkaline medium (pH 8.5–10.5) inhibits 94–99% of common bacterial contaminants, making it uniquely suitable for semi-open systems and first-time growers. Source: Habib et al. (2008), FAO Circular No. 1034.

7 Market Analysis

Segment	2023 Value	CAGR
Global microalgae market	$4.2B	12.4%
Algae bioplastics	$97M	~11%
Global biofuels	$193B	8.3%
Alternative protein (global)	$29B	14.5%
US animal feed	$67B	3.1%

We are not limited to a single output or a single market. The same cultivation infrastructure can be tuned by species selection, harvest timing, and processing method to produce protein, lipids for fuel, or biopolymer precursors. That flexibility is a structural advantage over single-product producers.

Where We Compete

- Near term, animal feed and human nutrition. Spirulina at 60–70% protein by dry weight commands $30–70/lb retail
- Medium term, bioplastic precursors. Algae-derived polyols can replace petroleum-derived inputs in polyurethane manufacturing
- Long term, biofuel feedstock. Lipid-rich species grown in parallel with protein-focused cultivation
- Ongoing, textile and specialty materials. Phycocyanin (blue pigment from spirulina) sells for $500–3,000/kg in food-grade form

DIFFERENTIATOR

No community-scale waste-fed algae operation runs in Northern California. Our feedstock cost is near zero because we are solving a disposal problem for restaurants. That structural cost advantage, combined with open-source hardware and AI-driven optimization, is not easily replicated by industrial producers who depend on purchased inputs.

8 Technology Stack

FarmBot Genesis XL Specifications

Spec	Value
Work area	3m × 6m (18 sq m)
Control	Raspberry Pi 4 + Arduino Mega 2560
Connectivity	WiFi, REST API + WebSocket
Scripting	Lua sequences (scheduled + event-triggered)
Sensor support	Analog (2×), Digital I/O (6×), I2C via RPi
License	Open source (MIT)
Price	$7,995 (Genesis XL v1.8, confirmed farm.bot)

Software Pipeline

```
FarmBot OS  (on-device Lua sequences)
  algae_morning_check.lua  !’  pH read, dose if needed
  nutrient_dose.lua        !’  EC check, top up medium
  harvest_trigger.lua      !’  OD threshold !’ pump on
  growth_log.lua           !’  InfluxDB time-series !’ Grafana dashboard
```

Sensor Integration

Sensor	Cost	Notes
pH: Atlas Scientific EZO-pH	$170	I2C output readable by Raspberry Pi. Calibrate with pH 7.0 + 10.0 buffers for spirulina range.
Optical Density (DIY LDR + LED pair)	~$15	Measures culture turbidity. Triggers harvest when OD750 reaches threshold. Logs to InfluxDB.

Simulation Before Hardware

Open it at johnnyautoseed.com/sim. Solarpunk Farm Sim (v0.0.5) is a browser-playable model of a single SACSA node: sixteen raised beds, a planting rover that navigates the bed lanes and docks to charge, a solar-and-wind battery that gates how fast crops grow after dark, an algae bioreactor that turns harvest waste into biomass, and a processing shed that packs shares into crates for a delivery run with zero food miles. Every structure carries a spec card, and a guided tour walks the camera through the whole argument end to end.

The reason it exists is cost. A proposal that describes a robot tending a plot reads differently from one a reviewer can open and operate, and the simulation reaches that second state without a hardware budget. It is a model of the system, not a measurement of one: nothing in it is a claim about a physical plot in Butte County, and it is labeled that way wherever it is shown.

SENSING ROADMAP (NOT YET BUILT)

The next credibility step after the simulation is real readings from a real bed: soil moisture, air and soil temperature, flow rate, and tank level on low-cost ESP32 boards, with inference running on the device rather than shipping every reading to a server. This is the only item in the technology plan that cannot be done in software, and it is deliberately sequenced after the simulation, because a season of real readings is what a second grant funds. Nothing described here is deployed today.

9 Operations Plan

HUMAN TIME REQUIRED

15–30 minutes per day (visual inspection, anomaly response, equipment check). Everything else is managed by the automation stack, giving operators more time to learn, improve, and train others.

Daily Automated Schedule

Time	Action
06:00	pH check, bicarbonate dose if below 8.5
08:00	Lights on (16h photoperiod)
10:00	Nutrient EC check
14:00	Temperature check, heating mat if below 28°C
16:00	Optical density measurement, flag if harvest ready
22:00	Lights off

Time	Action
23:00	Daily data log to InfluxDB

Harvest Process (Every 2–3 Days)

1. FarmBot triggers harvest pump when OD750 reaches 0.4–0.6
2. Culture pumped through 50-micron filter cloth
3. Filter cake rinsed with RO water to remove salt residue
4. Biomass spread on dehydrator trays at 40°C for 6–8 hours
5. Dried spirulina ground to powder, packaged in amber glass jars
6. Batch record logged: harvest date, wet yield, dry yield, OD reading

Nutrient Medium (Zarrouk's, per liter added)

NaHCO3 16.8g · NaNO3 2.5g · K2HPO4 0.5g · trace minerals 1mL. Monthly cost for a 5L system: ~$15–20 at retail. Bulk purchasing for a 200L commercial setup reduces this to ~$800/yr total (~$0.08/L/month when buying NaHCO3 and NaNO3 in 25kg sacks).

10 Financial Projections

Phase 1 is a 12-month validation and infrastructure build. The budget includes founder cost of living, which is non-negotiable for a full-time operator. MIT Living Wage estimates for Butte County set the floor at ~$42,000/year for a single adult; this plan rounds up to $48,000 to account for health costs and mobility.

Phase 1 Total Budget: 12 Months

Category	Item	Cost
Equipment	FarmBot Genesis XL v1.8	$7,995
Equipment	Photobioreactor builds (×4, DIY)	$2,000
Equipment	Sensor suite per PBR (pH, temp, OD) ×4	$3,200
Equipment	Dehydrator + processing station	$1,200
Equipment	Edge AI hardware (local inference node)	$1,500
Operations	Nutrient supply, 12 months	$800
Operations	Waste collection logistics + sterilization	$2,400
Operations	Packaging, lab supplies, contingency	$2,000

Category	Item	Cost
Legal + admin	Insurance, accounting, compliance	$3,500
Outreach	Restaurant partnerships, community events	$1,500
Software	Dev tools, hosting, data infrastructure	$1,200
Subtotal: Operations		$27,295
Founder cost of living	12 months @ $4,000/mo	$48,000
Grant writing	Consultant + fiscal sponsorship fees	$8,000
Reserve / scale buffer	Unexpected costs, Phase 2 prep	$116,705
TOTAL PHASE 1		$200,000

Per-Unit Economics (Per 50L Photobioreactor)

Metric	Per PBR (50L)	4 PBRs	20 PBRs	100 PBRs
Volume	50L	200L	1,000L	5,000L
Yield (@ 2g/L/day)	100g/day	400g/day	2kg/day	10kg/day
Monthly dry biomass	~3kg	~12kg	~60kg	~300kg
Revenue ($30/kg whsl.)	~$90/mo	~$360/mo	~$1,800/mo	~$9,000/mo
Hardware cost	~$1,700	~$6,800	~$34,000	~$170,000
Operating cost/mo	~$25	~$100	~$500	~$2,500

Revenue figures use wholesale protein pricing ($30/kg). Retail spirulina commands $50–70/kg and bioplastic precursor pricing is higher still. These are conservative floor estimates.

11 Investment & Return

Revenue Ramp

Phase	Scale	Annual Revenue	Notes
Phase 1	4 PBRs · Year 1	$4,320/yr	4 × $90/mo = $360/mo · 200L total · 12 kg/mo
Phase 2	20 PBRs · Years 2–3	$21,600/yr	20 × $90/mo = $1,800/mo · 1,000L · 60 kg/mo
Phase 3	100 PBRs · Year 4+	$108,000/yr	100 × $90/mo = $9,000/mo · 5,000L · 300 kg/mo

Formula: 2 g/L/day × 50L × 30 days ÷ 1,000 = 3 kg/PBR/mo × $30/kg wholesale = $90/PBR/mo. Retail pricing ($50–70/kg) and bioplastic revenue are upside scenarios not included in these estimates.

Payback by Track

Track	CapEx	Net Annual Return	Payback
Track 01: Algae production	$14,545–$15,545	$1,600–$3,300	4–10 years
Track 02: Food waste diversion	$2,350–$4,450	$1,850–$5,700	0.4–2.4 years
Track 03: Grant-funded community	$2,400–$4,300	$3,150–$6,900 value del.	0.3–1.4 years

GRANT-ADJUSTED ASK

The $200K total ask is primarily grant-funded. With $150K from USDA SBIR, CDFA, and NSF programs, the equity-equivalent need drops to ~$50,000.

At 4 PBRs (Phase 1 baseline), estimated net production revenue is ~$3,120/yr after opex, a 16-year payback on $50K alone. At 20 PBRs (Phase 2, fully grant-funded expansion), estimated net revenue is ~$15,600/yr and the $50K equity equivalent pays back in ~3.2 years.

The grant writing line item ($8,000) is designed to return 18× its cost in awarded funding.

12 Funding Strategy

PHASE 1 FUNDING GOAL: $200,000

We are pursuing multiple funding tracks in parallel. The v1.5 proposal established a $174,103 Phase 1 budget. This plan targets $200,000 to additionally cover founder cost of living ($48,000 annualized) and build a reserve buffer for Phase 2 scaling.

Track 1: Grants (Primary Path to $200K)

Program	Award Range	Fit	Status
USDA SBIR Phase 1	$275K max	Food security, controlled environment ag	Preparing application
CDFA Urban Agriculture Grant	$75K max	CA-specific, annual cycle	Next open window
NSF SBIR (food tech)	$256K max	Alternative protein, sustainable food	Preparing application
DOE BETO	$5M+	Algae bioproducts (Algenesis precedent)	Phase 2 target
Chico State RSCA	$10K max	University research partnership	Partner outreach
EPA P3	$25K Phase 1	Sustainable technology, community benefit	Researching
CDFA Pollinator Habitat Program / WCB Monarch & Pollinator Rescue	$2M max (PHP)	Habitat conversion at scale; funds RCDs, nonprofits, universities, tribes	Phase 2 target, requires RCD/ nonprofit partnership or fiscal sponsor

THE REAL CONSTRAINT IS THROUGHPUT, NOT DISCOVERY

Finding grants is already solved. An automated scanner runs against the federal grants API and surfaces open solicitations in the food-security, controlled-environment agriculture, and agricultural robotics categories, which are funded categories right now. Nothing downstream of that scanner writes or tracks anything, so the number of applications actually submitted is capped by founder hours rather than by the number of programs that fit.

Closing that gap is the highest-leverage funding work available and it costs no capital: a tracked pipeline per program with its deadlines and required attachments, document extraction so prior proposals, budgets, and letters of support are reusable rather than rewritten, and a standing narrative package that the simulation and the published research library both feed. Application throughput, not program fit, is what determines how much of the $200,000 arrives.

PROOF ARTIFACT FOR THE GRANT TRACK

Grant reviewers fund credibility. The strongest asset available today is the SACSA node simulation described in the Technology Stack section: it demonstrates the loop, the robotics, and the community distribution model in something a reviewer can open at johnnyautoseed.com/sim, and it required no hardware purchase. The honest comparison is against instrumenting a physical bed, which produces stronger evidence but needs parts lead time and money the grants are supposed to provide. If only one happens first, the simulation wins on cost per unit of proof. Instrumentation wins only when the claim being made is specifically about a real plot.

Track 2: Founding Subscribers

Pre-sales before purchasing equipment. Target: 20 founding restaurant partners at $50/month waste-diversion credit = $1,000/month. Over 12 months: $12,000 toward operating costs.

Track 3: Product Revenue

Revenue from parallel software products funds equipment purchases and reduces grant dependency. Target: $2,000/month by month 6 of Phase 1.

PHASE 3 VISION: LAND ACQUISITION FOR R&D

If funding allows, Johnny Autoseed intends to acquire land in Butte County to run closed-loop supply chain R&D. The land would serve as a live testbed connecting food waste processing, algae production, yard-waste composting, and community food distribution, a physical proof-of-concept for everything else in this plan.

13 Team & Partnerships

Christopher Tavolazzi: Founder

Systems architect and software developer based in Butte County, California. In Phase 1 the founder is a true one-man-show: establishing the first round of SOPs, handling initial business development and partner relationships, running R&D, and serving as the first boots on the ground with hands building the tech stack. This stays a solo operation until hiring goals can be met based on revenue or additional funding.

The founder is rooted in the Butte County community, and those local relationships are the moat this plan is built on: the restaurant feedstock contracts, the school and food-bank partnerships, and the local trade relationships that make the closed loop work. Johnny Autoseed exists because no one should have to choose between food and rent, and because the tools to close that gap can be built and shared locally.

Entity Structure: One LLC, Several Brands

Johnny Autoseed LLC is the parent entity over the founder's other operating brands, not only the food-systems work described in this plan. Those brands include an advisory practice, a consumer technology media property, and a published book, each with its own audience and its own revenue path.

This is deliberate and it cuts both ways. The benefit is a single legal and financial spine: one entity to bank, insure, and file for, and adjacent audiences that make the food-security argument to people who did not arrive looking for it. The cost is that four brands of receipts land in one set of books, and that the founder's attention is genuinely shared rather than nominally shared. Both are named as operational risks in the Risk Analysis section, and the accounting one is a Phase 1 action item rather than a Phase 2 nicety.

Active Recruitment Gaps

Role	Need	Target
Algae cultivation expert	Protocol validation, contamination management	Chico State biology dept
Food safety / CDFA	Commercial sale compliance	CalAgrAbility network
Marketing / community	CSA launch, farmers market	Local food network
Field training coordinator	Curriculum design, school partnership liaison, youth programs	Butte College workforce dev; 4-H / FFA
Regulatory research analyst	Ongoing regulatory intelligence for advisory clients	Fiverr / VA service (Phase 2)

Strategic Partners

- FarmBot Inc.: open-source tech relationship with community collaboration on sensor integration
- Chico State University: biology and environmental science partnership; letter of support for USDA grant; potential research collaboration
- Butte College: community college workforce development and technical training programs
- Local K-12 schools, 4-H, and FFA: field training partnerships for youth; project-based learning in biology, engineering, and systems design
- Recology Butte Colusa: Butte County franchise waste hauler; SB 1383 compliance operator; potential feedstock co-diversion agreement
- Butte County Food Bank: mission alignment; community pilot site candidate; distribution partner for locally grown protein
- Cal Water District: turf rebate program administration; Yard-to-Yield client referral pipeline; potential co-promotion on water conservation
- Butte County Resource Conservation District: potential partner for institutional pollinator-habitat funding (CDFA Pollinator Habitat Program, WCB Monarch & Pollinator Rescue Program) that requires an eligible entity; NRCS EQIP referral path for larger properties
- Xerces Society: free California pollinator plant lists and habitat-establishment guides; technical backbone for Yard-to-Pollinator plant selection

14 Mission & Impact

> ***"The goal is not a product. It is a model: waste in, value out, community stronger."***

Every pilot we run is a proof point that local communities can close resource loops that the global industrial system leaves open.

Impact Area	How We Deliver It
Local jobs	Cultivation operators, property systems analysts, AI and data technicians, logistics and processing roles, field trainers, all local, tied to infrastructure that cannot be offshored
Education, workforce & youth	Hands-on field training in algae biology, controlled-environment agriculture, sensor integration, and data analysis. Partnerships with K-12 schools, 4-H, FFA, community colleges, and universities.
A new local industry	Industrial algae cultivation is a mature, multi-billion-dollar industry in East Asia, Europe, and the Middle East. It does not yet exist at community scale in Northern California.
Supply chain resilience	Local bioplastics, biofuels, protein, and textile inputs, less reliance on fragile global supply chains. Materials grown in any community with organic waste, land, and sunlight.
Climate	Food waste diverted from landfill reduces methane. Lawn conversion cuts water use. Algae cultivation sequesters CO2 directly. Bio-based materials displace petroleum inputs.

Impact Area	How We Deliver It
Food security	High-protein biomass can reach food banks and community kitchens at near-zero cost. Converted yards add local food capacity the SACSA network can harvest and distribute.

Community Roadmap

- Phase 1: 20 restaurant partners, validated waste-to-algae pipeline, Yard-to-Yield advisory track live, first school/institution partnership established
- Phase 2: First commercial outputs, animal feed and bioplastic precursor supply agreements; first formal field training cohort with a local school or community college
- Phase 3: Full system published open-source so any community can replicate and improve it; regional SACSA network operational

15 Evidence Base: The Science

All claims in this plan trace to these peer-reviewed sources. This section is the evidentiary spine.

Protein and Nutrition

Study	Protein % dry weight	Method
USDA FoodData Central	57.5%	Kjeldahl (N × 6.25)
Becker (2007), Biotechnology Advances	60–70%	Multiple assay methods
Vonshak (2002), CRC Press	63–68%	Kjeldahl
Habib et al. (2008), FAO	60–70%	Review of 40+ studies

Spirulina true digestibility: 83–90% (in vivo). Comparable to eggs (97%) and superior to soy (78%), wheat (86%), and pea (80%).

Yield Benchmarks by System Type

System	Yield g/L/day	Source
Open raceway pond	0.5–1.5	Richmond (2004)
Open raceway, optimized	1.0–3.0	Belay (1997)
Closed tubular PBR	2.0–5.0	Vonshak (2002)
Closed flat-panel PBR	3.0–6.0	Acien et al. (2013)
Indoor LED-lit PBR	2.0–4.0	Chen et al. (2016)

Johnny Autoseed target: 2–3 g/L/day in FarmBot-managed indoor closed PBR, supported by Chen et al. indoor LED data.

Safety Record

- FDA GRAS status since 1974 (21 CFR 172.945)
- 70+ peer-reviewed clinical trials in PubMed as of 2024; no serious adverse effects at normal doses
- Commercial human consumption for 50+ years (Lake Texcoco, Mexico 1974)
- FAO formally endorsed spirulina as suitable for human food and animal feed (2008)

Labor as the Key Cost Lever

At pilot and small commercial scale (50–500L), labor represents 35–60% of total production cost. At industrial scale this drops to 15–20% via economies of scale. For small-scale producers to be economically viable, labor automation is THE critical variable. This is the core scientific justification for FarmBot integration. Source: Acien et al. (2013), Bioresource Technology 148:215–223.

16 Prior Art: Who Is Building This

Industrial Producers

Company	Scale & Revenue	Key Lesson
Cyanotech Corporation (OTC: CYAN)	~300 MT spirulina/yr from 90 acres; revenue $12–16M/yr; gross margin 40–45%	Local provenance sells at a real premium (30–50% above imported product)
Earthrise Nutritionals (California)	~500 MT/yr; production cost $2–5/lb; wholesale $15–30/lb	Industrial production leaves massive margin available for premium direct channels

Venture-Backed Startups

Company	Raised	Model	Key Lesson
Spira	$5.5M	Closed-loop tubular PBRs; pivoted to B2B phycocyanin supplier	Phycocyanin (blue pigment) increasingly valuable as synthetic dyes face regulatory pressure
iWi / Qualitas Health	$20M+	Desert saline outdoor ponds for omega-3 DHA and EPA oils	"Skip the fish, go straight to the algae source" is a powerful repositioning

Company	Raised	Model	Key Lesson
Pond Technologies (TSX: POND)	Public	Algae grown using CO2 from industrial factory emissions	CO2 waste stream as input dramatically reduces nutrient cost

Algenesis / Blueview, $32.2M raised, DOE-funded, published in Nature

UC San Diego spinout (CEO Stephen Mayfield) converting algae oil into Soleic, a high-performance polyurethane that fully biodegrades. 97% consumed at 200 days with no microplastic residue. Consumer brand Blueview makes the world's first 100% biodegradable shoe (sole + upper). Algae flip-flops licensed to Reef.

The co-product model: the $3/pair target only works when algae is grown primarily for jet fuel or omega-3 oils, with the shoe foam as a waste-stream byproduct. The DOE grant was titled "Pre-Pilot Scale Production of Algae-based Jet Fuel AND Polyurethane Monomers", jet fuel listed first. The shoe is the byproduct. Current material is 52% bio-content (target: 100%).

The Gap Nobody Has Filled

What Exists	What Does Not Exist
Industrial spirulina at $2–5/lb production cost	Open-source residential-scale cultivation protocol
Venture-backed closed PBR startups	FarmBot-assisted, semi-automated algae management
Small farm CSA operators (all manual, 2–4 hrs/day)	Technology-leveraged 15-min/day cultivation system
Home growing kits (AlgaeBarn, manual)	Robotic precision management with data logging
Algae as B2B ingredient play	Community-owned, open-source food production model

17 Risk Analysis

Technical Risks

Risk	Likelihood	Impact	Mitigation
Contamination	Medium	High	Spirulina pH 8.5+ is natural barrier; weekly microscopy
Temperature instability	High	High	Heating mat + thermostat; indoor placement; redundant probe
FarmBot sensor integration	Medium	Medium	Atlas Scientific documented with RPi; community support
Equipment failure	Low	Medium	Open-source; spare parts <$50; community repair docs

Market Risks

Risk	Likelihood	Impact	Mitigation
Low CSA uptake in Chico	Medium	High	Pre-sales validation before buying equipment
Regulatory hurdle for commercial sale	Medium	High	CDFA consultation before first sale; Chico State partnership
Unlicensed-contracting exposure (BPC §7026.1(b) treats on-site coordination, scheduling, and bid solicitation on a homeowner's behalf as contracting)	Low	High	Live tiers capped at off-site design/advisory plus informational-only (not vetted/affiliated/ negotiated) contractor referrals; Tier 3 project-coordination model on hold until we choose a CSLB license, an HIS registration (BPC §7152) under a licensed partner, or a design-only structure; Informational Systems Analysis Waiver required on every engagement
Price pressure from online sellers	Low	Low	Local/fresh/traceable story is strong; CSA removes price comparison

Operational Risks

Risk	Likelihood	Impact	Mitigation
Founder attention diluted across the entity's other brands	High	High	Measured, not assumed: a 30-day review of development activity found internal tooling absorbing several times the effort that went into this venture. Standing weekly allocation for revenue-facing work; tooling justified only where it removes a named bottleneck
Single point of failure: one founder holds every relationship and system	High	High	Written SOPs from the first engagement; advisory delivery is the first track scheduled for delegation (Q3); partner relationships documented, not held in one head
Bookkeeping drift across brands sharing one entity	Medium	Medium	Categorized capture of receipts and invoices per brand starting in Phase 1. Untangling a year retroactively lands during the same window as grant reporting
Proof artifacts stay unpublished on the founder's machine	Medium	Medium	The SACSA simulation and supporting research are only worth what a reviewer or client can reach. Publishing and backing up each artifact is part of finishing it

TOP PRIORITY ACTION ITEMS

1. LLC formed: open business accounts and begin grant applications immediately
2. Build the application pipeline: grant discovery is automated and submission is not, and throughput is what caps non-dilutive funding
3. Publish the SACSA node simulation: the cheapest credible proof artifact available, and it already exists
4. Pre-sales validation before equipment purchase: de-risk the market assumption before committing capital
5. Secure 20 restaurant partners: waste feedstock agreements are the foundation of the cost model

18 Number Validation

Every quantitative claim in this plan has been reviewed two ways: the arithmetic was checked algorithmically against the stated values, and the underlying sources were read and verified by human eyes.

What Was Verified

- Phase 1 budget arithmetic: all 11 ops line items sum to $27,295; four components sum to $200,000 total
- FarmBot pricing: $7,995 for Genesis XL v1.8 confirmed against live farm.bot product page
- Per-PBR unit economics: 50L × 2 g/L/day × 30 days ÷ 1,000 = 3 kg/mo × $30/kg = $90/mo per PBR
- Power cost chain: 0.24 kWh/day × $0.16/kWh × 365 = $14.02/yr (plan states ~$14/yr)
- Track 01 ROI: $14,545–$15,545 ÷ $1,600–$3,300 net annual = 4.4–9.7 years (plan states 4–10 years)
- CO2 sequestration: 4 PBRs × 100 g/day × 1.8 g CO2/g biomass = 263 kg CO2/yr
- Market CAGR: $4.2B × (1.124)^5 = $7.53B, consistent with the ">$7B in 5 years" projection
- Nutrient cost: Zarrouk's recipe at bulk pricing = ~$423/yr for 200L; budget of $800/yr accounts for pH buffering overhead
- Source links: every cited URL verified reachable; all academic DOIs resolve to the correct papers

What Was Corrected

- FarmBot price was listed as $3,495 (old v1.x hardware); corrected to $7,995 (Genesis XL v1.8)
- Track 01 annual power cost was $24/yr; corrected to $14/yr (0.24 kWh × $0.16 × 365)
- Track 02 net benefit low end was $1,750; corrected to $1,850 (value_lo " opex_hi, consistent methodology)
- Track 01 ROI range was "5–7 years"; widened to "4–10 years" to match the worst-case 9.7-year computation
- Nutrient cost difference between retail 5L recipe ($15–20/mo) and bulk 200L budget ($800/yr) was unexplained; bulk purchasing note added inline
- Executive summary said "six grant programs identified"; the Funding Strategy table lists seven, so the summary was corrected to match the table
- Cover badge claimed "~28 min read · ~6,600 words" against a measured 9,121 words at the time it was checked; corrected to the actual count of the current draft

What This Plan Does Not Claim

- The simulation is a model, not a measurement. Solarpunk Farm Sim demonstrates the system design. It reports no readings from any physical plot and is not offered as evidence that one exists
- Sensing is scoped, not deployed. The soil, temperature, flow, and tank-level instrumentation described in the Technology Stack is a roadmap item with no hardware purchased
- Nothing is manufactured or fulfilled today. Johnny Autoseed currently sells information and advisory design, which is rung 1 of the capability ladder in Section 4. Feasibility varies by city and county, so projects are evaluated case by case rather than delivered against a standard service description
- The later rungs are a sequence, not a schedule. Simple above-ground builds, installations, and the closed loop each open when demand, capability, and the legal path for that jurisdiction all clear. No rung carries a promised date, and none is skipped because funding arrived early

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