

Greenhouse & Indoor Growing

Best Practices for Rural Alaska Native Communities

About

This best practices document includes lessons learned from Alaska Native-led growing and food sovereignty projects across the state. It was compiled by Renewable Energy Alaska Project (REAP) and Sustainable Energy for Galena Alaska (SEGA) to help communities navigate the process and challenges of establishing food-growing operations in remote northern environments. Practitioners consulted in spring 2026 were Kelly May from Alaska Native Greens in North Pole, Cayley Eller from the Tyonek Tribal Conservation District in Anchorage and Tyonek, Heidi Rader from the UAF Cooperative Extension in Fairbanks, Tim Meyers from Meyers Farm in Bethel, Priscilla Goulding and Lauren Burch from Southeast Island School District on Prince of Wales Island, and Amy Erfling from the Central Council of the Tlingit & Haida Indian Tribes of Alaska in Juneau.

Key Recommendations

1. **Staffing is everything.** Two committed, paid people are the minimum for a sustainable indoor operation.
2. **Plan for grant-funded operations.** Produce sales alone will not cover costs in remote communities.
3. **Know your operations costs.** Consider ongoing electricity and heating costs alongside construction expenses.
4. **Start small, learn, then scale.** Consider a small pilot growing operation before investing in large capital expenses.
5. **Incorporate Native plants and community eating habits.** Connect growing to traditional foods and community eating habits.
6. **School partnerships increase impact.** They sustain positions, engage youth, and connect food to education.
7. **Use available local technical assistance.** Fairbanks Soil & Water, UAF Extension, Alaska Native Greens, Tyonek Tribal Conservation District, and other peer communities want to help.

1. Staffing: The Most Critical Factor

The Staffing Challenge in Rural Communities

- Staffing is consistently the most common reason greenhouse projects fail in rural Alaska. Finding the right people and being able to pay them is essential. Projects that rely on volunteers and passionate owner-operators without a sustainable business plan are a recipe for burn-out and short-lived growing efforts.
- Indoor greenhouses require constant attention. Unlike outdoor gardens, unattended indoor growing operations can kill all produce. Staff must be available when things need to be done, not just during weekday business hours.
- Plan for at least two people who are interested in and capable of managing growing operations.
- Grant-funded projects with hired staff need involvement from an owner-operator or community farmer for management and growing guidance.
- Before launching a greenhouse, ask: Who in this community would genuinely want to do this work? Could we pay them fairly and consistently?

Staffing Models That Work

- **Youth employment:** Hire students as paid interns (e.g., \$15/hr) for farm labor. This builds community capacity and workforce skills and keeps labor costs reasonable. This requires a capable manager to teach and manage seasonal young employees.
- **School partnerships:** A supervisor who also works at the school creates a natural, sustainable partnership.
- **WWOOFers:** Communities like Igiugig bring in [WWOOFers](#) (volunteer farm workers) for the summer season as supplemental labor, but this requires housing.
- **AmeriCorps:** Southeast Island School District used AmeriCorps to staff their greenhouses, with mixed success. Some individuals were very successful, others had high training and oversight needs or frequent turnover.

Other Staffing Considerations

- **Proactive pest control:** Aphids and other greenhouse pests can quickly run rampant and destroy your crops. Southeast Island School District recommended staff be coached on early pest prevention, identification, and mitigation.
- **School leadership support:** If partnering with a school, cultivating sustained support from district leadership is vital.

2. Financial Sustainability & Funding

Set Realistic Financial Expectations

- Think of community greenhouse operations as nonprofits. As one practitioner shared: "You're not going to bring in enough money from produce to pay for the costs." Another

said: “It’s not going to run just on its own. Someone has to eat it somewhere.” Plan accordingly.

- Calculate your numbers before building: electricity costs, heating costs, staffing costs, and expected revenue. Know your break-even point.
- Set up financial structures that prevent falling into debt, like pre-orders, subscriber models, and grant-funded overhead.

Grant Strategies

- Successful operations (Igiugig, Kodiak, Tyonek) have typically secured funding for both building the greenhouse and paying people to work there.
- Possible avenues: Native American Agriculture Fund, tribal food sovereignty grants
- UAF Cooperative Extension and Native Greens can help communities identify grant opportunities and write proposals, including training grants for community members.
- Consider grant-funded free distribution models: covering overhead with grants and distributing produce for free has worked well in Tyonek.

Revenue & Sales Models

- Know your buyers' expectations upfront: Schools and institutional buyers often have set payment cycles, so plan your cash flow accordingly.
- Consider a tiered sales approach: pre-orders/subscribers as a base, institutional buyers as steady revenue, and 'leftover' produce sold at farmers markets, flea markets, or directly to restaurants.
- Community cooperative models can add complexity. Individual growing plots may be an easier first step for some communities.

3. Infrastructure & Technical Decisions

Space Planning

- Consider multi-story configurations to maximize growing area within a given footprint.
- Three-level shelving systems can hold 150+ plants in a relatively compact space.

Heating & Energy

- With good insulation (like in a Conex), LED grow lights can often generate enough residual heat to maintain adequate growing temperatures, but then cooling and ventilation are needed for the warmer months.
- Renewable energy integration (like solar or biomass) has been key to financial sustainability for Igiugig, Kodiak, and Tyonek.

- Get detailed electricity and heating cost estimates before committing to a design, as these are often the largest operational expenses.
- Heat and electricity cost may change structure decisions (i.e., readily and cheaply available biomass but expensive electricity may switch priority from insulation to natural light)

Hydroponics vs. Soil Growing

- **Deep water culture (DWC):** A well-proven hydroponic system for communities; Fairbanks Soil & Water Conservation District can provide hands-on setup assistance.
- **Hydroponic towers:** Good for lettuce and greens; T3 in Galena has used one successfully. Faster growth and year-round production, but limits what crops you can grow.
- **Soil growing:** Growing initiatives that utilize permafrost ground will require further research and troubleshooting. Meyers Farm uses this method, involving a two-year thawing process and high tunnels instead of heated indoor space. Greenhouses that use soil, like in the Southeast Island School District, have struggled with aphids and other pests, as well as reliable composted materials.
- Sources recommended against mixing soil growing and hydroponics in the same greenhouse. Southeast Island School District suggested having a conex for hydroponics, another for raised beds, and another for mushrooms.

Humidity & Ventilation

- Dehumidifiers are recommended for indoor growing unless ventilation/airflow systems are robust. This should be considered in electricity costs.
- Good airflow can substitute for dehumidifiers but requires intentional design from the start.

Other Technology Considerations

- **Automation:** Install automated monitors and systems to cut down on operational burden.
- **Aquaponics:** Great way to engage students, but hard to manage for Southeast Island School District. Issues included overfeeding, water quality, pests, and difficulty sourcing.

4. Start Small and Scale Intentionally

Pilot Before Committing

- Begin with a small pilot space, either outdoors during the summer or inside with hydroponics, to learn what crops work, what buyers want, and what a growing operation requires before investing in larger infrastructure.
- Expect and plan for ups and downs with community champions, funding cycles, and external disruptions like COVID-19 and supply chain changes.
- Scale up after you identify reliable buyers, a staffing model, and a financial sustainability plan.

Low-Barrier First Steps

- Consider high tunnels and raised beds as the lowest-cost, lowest-risk starting point before committing to year-round indoor growing.
 - High tunnels: Take down plastic seasonally (spring and fall) to protect the equipment.
- Aero gardens and small-scale hydroponics are low-cost ways to learn indoor growing techniques and build community interest.
- Optimize outdoor and seasonal growing before pursuing year-round indoor operations—summer harvests can generate significant community value with far less overhead.

5. Crop Selection

Best Crops to Start With

- Focus on fast-growing produce indoors for quick returns and staff motivation.
- **Leafy greens and lettuces:** Fastest turnaround, well-suited to hydroponic systems.
- **Root crops (carrots, potatoes):** Start indoors, then transfer outside. Potatoes can have a big impact.
- **School-friendly crops:** Peas, carrots, and other low-prep vegetables work well for school harvests and cooking integration.

Native & Traditional Plants

- Alaska Native Greens grows and harvests native species indoors, with long-term goals of expanding access to traditional foods.
- Promising native species include: Sea spinach, beach greens, goose foot, and marigolds, in progress with native seed harvest grants in Hooper Bay and Anvik.

6. Community Engagement & School Partnerships

Building Community Investment

- Community greenhouses succeed when people feel ownership. Engage community members early through advisory groups, surveys, and public events.
- Use visiting experts (e.g., UAF Extension, Alaska Native Greens, Fairbanks Soil & Water) for seed distribution, training days, and public events as opportunities to identify interested growers and build an advisory group.
- Create a community input survey early in the planning process to understand needs, interests, and concerns.
- Host harvest parties and public tasting events to generate excitement and normalize local food consumption.
- Be intentional about distribution models. Giving produce away for free can build community engagement, but it needs to fit your long-term financial model. It would not be successful to transition to paid produce after giving food away for free.

School Integration

- School partnerships can create staff positions, engage youth, and connect food production to education.
- Schools can integrate greenhouses or hydroponics into curriculum: students start seeds in spring, harvest in fall, and learn food preparation.
- Fall harvest parties at schools create memorable community events that sustain enthusiasm year over year.
- The Prince of Wales School District has been noted as a strong model for school-based growing programs.

7. Resources & Technical Assistance

Organizations

- **Fairbanks Soil & Water Conservation District (Mel Sikes, Scott Faulkner):** offers hands-on training in setting up basic hydroponic systems; will travel to communities.
- [UAF Cooperative Extension](#) (Heidi Rader): sends seeds to 25 Interior tribes, offers soil and gardening training, school programs, and community engagement support.
- **Alaska Native Greens (Kelly May):** training programs for communities in good start-up positions; knowledge of native species growing and food sovereignty.
 - Copper River area identified as a strong startup example
- **Tyonek Tribal Conservation District (Cayley Eller):** available for peer technical assistance; can help with season plans, crop selection, and operations troubleshooting.
 - Experience with gravity drip irrigation, solar, yurt, deep water culture hydroponics, and school partnership.
- **Alaska Food Policy Council:** hydroponics working group with statewide connections.

- **Native American Agriculture Fund:** Grant funding source for tribal food and agriculture initiatives.
- [Kodiak Leadership Institute / Alutiig Grown](#): multiple greenhouse model, strong example of scale and community integration
- **Tlingit and Haida:** Connected to growing operations across Southeast Alaska, including those that use biomass, with knowledge in operational costs, beneficial grants, and staffing models.