ROOTED IN NEBRASKA:

A TEACHER'S GUIDE TO SPECIALTY CROP PRODUCTION IN SCHOOLS

ALEC

CENTER *for* RURAL AFFAIRS

NEBRASKA DEPARTMENT OF EDUCATION

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WELCOME & OVERVIEW

Image:
Student from Banner County High School maintains greenhouse.

WELCOME LETTER FROM PROJECT LEADERS

Welcome to *Rooted in Nebraska: A Student Guide to Specialty Crops and Careers*, a resource created to highlight the power of Farm to School education across our state. This booklet brings together the real stories, tools, and lessons learned through the Nebraska Young Farmer Program: Introducing Specialty Crop Production (NYFP), a two-year pilot project designed to expand hands-on agricultural education in rural Nebraska schools.

As leaders of this project, we, Kirstin Bailey, Jenna Sutterfield, and Stacie Turnbull, combined our backgrounds in food systems, agricultural education, community development, and communication to support one shared goal: to inspire the next generation of young farmers and food system leaders by connecting students to the people, crops, and careers that shape Nebraska agriculture.

Through NYFP, students explored career pathways while growing and studying specialty crops like mushrooms, grapes, vegetables, flowers, popcorn and goats. With support from expert farmers and dedicated educators, they planned gardens, managed greenhouses, tracked budgets, harvested produce, and discovered how connected their skills are to real-world careers.

This work was made possible through the generous support of the USDA Farm to School Grant Program, along with our committed partner schools: Banner County Schools and Bancroft-Rosalie Community School. We are deeply grateful to the teachers who made this program thrive, and especially to the students whose questions, effort, and enthusiasm brought it to life.

For other schools and educators interested in launching similar efforts, this guide includes planning templates, crop-specific lessons, budgeting tools, and information on funding and sustainability. We hope it supports your school in growing something meaningful, not just in the soil, but in your students.

Thank you for joining us in this work. Together, we are growing something that lasts.

Warm regards,
The NYFP Project Team

Kirstin Bailey, Farm and Community Manager – Center for Rural Affairs

Jenna Sutterfield, Local Foods Associate – Center for Rural Affairs

Stacie Turnbull, Lecturer – Agricultural Leadership, Education and Communication, University of Nebraska–Lincoln

ABOUT THE PROJECT

The Nebraska Young Farmer Program: Introducing Specialty Crop Production (NYFP) was a two-year pilot initiative designed to enrich agricultural education in rural Nebraska schools by focusing on locally grown specialty crops. Led by the Center for Rural Affairs (CFRA) in partnership with Banner County Schools, Bancroft-Rosalie Community School, and the Nebraska Department of Education, the program supported eight schools with technical guidance, classroom presentations, and funding for hands-on learning.

Connecting Students to Crops, Careers, and Community

Each school began the project with a customized presentation aligned to their goals, specific school setup, and curriculum. These sessions were led by Center for Rural Affairs team members and covered crop planning, budgeting, and local career connections.

Kickoff Presentations Set the Stage

The Nebraska Young Farmer Program (NYFP) began by introducing students to specialty crops grown right here in Nebraska, including tomatoes, rangeland plants, grapes, mushrooms, and even goats. These presentations were designed to spark interest in food systems, sustainability, and agriculture careers beyond traditional commodity farming.

These kickoff presentations laid the groundwork for hands-on learning in greenhouses, raised beds, rangeland plots, and classroom experiments across the state.

Above:
Students from Lawrence-Nelson School examine the cover crops they planted.

Scope and School Locations

The Nebraska Young Farmer Program supported eight schools across the state, with a focus on underserved rural communities committed to long-term agricultural education. Each participating school received a $2,000 mini-grant to support supplies, infrastructure, and teacher training related to specialty crop production.

Participating schools included: Blue Hill, Lawrence-Nelson, Overton, East Butler, Banner County, Bancroft-Rosalie, Oakland-Criag, and Garden County.

Each site brought its own strengths, challenges, and goals to the program. Some emphasized greenhouse upgrades or livestock integration. Others focused on student-grown crops they could sell to their community, like mushrooms or popcorn.

STUDENT LEARNING OUTCOMES

Before and after the presentations, students completed a survey to reflect on their knowledge and awareness. The results show meaningful growth in every area.

"I didn't realize there were so many different kinds of careers connected to farming. It made me want to learn more." – *Student Participant*

"I didn't really know what specialty crops were. Now I do, there are so many." – *Student Participant*

"I liked how it was local, not just big farms. It helped me see how people in our area actually grow stuff for school lunches." – *Student Participant*

"After the presentation, I started thinking about having a greenhouse someday and doing markets." – *Student Participant*

"I liked how we planned backwards from the harvest, I didn't know that was something you had to do in farming." – *Student Participant*

Project Funding & Replication Support

The Nebraska Young Farmer Program (NYFP) was primarily funded through the USDA Farm to School Grant Program, which supports innovative efforts to connect schools with local food systems. Additional support came from Center for Rural Affairs grants, contributions from school districts, and in-kind donations from local farmers and businesses.

Mini-grants provided to schools helped cover various costs like greenhouse upgrades, irrigation systems, seeds, mushroom kits, fencing materials and equipment rental, laying a strong foundation that other schools can now replicate or build upon.

For schools or districts interested in launching a similar program, potential funding sources include:

- USDA Farm to School Grants – Nationally competitive grants supporting local food education
- State programs like Nebraska Thursdays and Harvest of the Month – Promote local purchasing and seasonal produce in schools. Learn More: education.ne.gov/ns/farm-to-school/harvest-of-the-month
- Private grants from agricultural foundations often support youth leadership, food systems, or nutrition projects
- Local business sponsorships and community fundraising – Can provide flexible funding and foster local support

Why It Matters

The Nebraska Young Farmer Program (NYFP) was developed in response to growing student interest in sustainable, small-scale farming, from beekeeping and mushrooms to flower production and greenhouse management. While traditional agricultural education often emphasizes large-scale commodity crops, NYFP introduced students to specialty crop systems that are rooted in place, connected to community, and accessible to beginning farmers.

Farm to School programs like NYFP strengthen student learning, improve school nutrition, and

GROWING MORE THAN CROPS: WHAT STUDENTS LEARNED

Across Nebraska, students jumped into specialty crop projects-from mushrooms to popcorn, goats to vegetables. What they walked away with went far beyond farming knowledge. They developed problem-solving skills, teamwork, and a deeper understanding of where food comes from-and many began to imagine new paths forward. Here's what they had to say:

Hands-On Learning Makes It Stick

Students across schools said the most valuable part was doing the work themselves. Whether it was transplanting plants, troubleshooting watering schedules, or building an irrigation system, the act of growing something changed how they learned.

"It's a lot different than just regular school. Going out to the greenhouse and actually planting-we're definitely learning more by doing it than from slides." – *Banner County Student*

"Watering sounds boring, but it's the biggest thing we learned." – *East Butler Student*

Image:
Students from Oakland-Craig School work on setting up goat fencing.

Problem-Solving Through Real Challenges

From managing humidity for mushrooms to protecting crops in a small greenhouse, students had to adapt and overcome.

"It was fun to experiment and try to overcome the challenges...it's always fun to learn something new." – *Overton Student*

"It made us work more together when we had limited space... If we had a lot of space, that wouldn't have happened." – *East Butler Student*

A New Perspective on Food Systems

Growing crops connected students with the larger food system-and sparked a deeper appreciation for the labor behind it.

"It's hard to think someone just grows all that. Even the stuff on the salad bar." – *East Butler Student*

"This project changed my views on local farming and where food comes from... it can change the outlook on food sources." – *Overton Student*

Planting Seeds for the Future

Some students left the project considering careers in agriculture. Others just felt more confident growing food or flowers for their own families.

"After this, I'm thinking about going to college to study agriculture." – *Lawrence-Nelson Student*

"I feel like I'm a professional planter now. Like I could go to Home Depot, buy what I need, and grow stuff." – *Banner County Student*

"When I think of growing flowers, I think of profit. When I think of vegetables, I think of feeding people." – *East Butler Student*

Teamwork and Self-Direction

From setting up watering rotations to organizing harvest days, students learned what happens when everyone pitches in and what happens when they don't.

"It teaches responsibility. If you don't go and tend the plants, they will die." – *Banner County Student*

help build strong local food systems. By focusing on Nebraska-grown specialty crops and creating hands-on learning opportunities, this program supported a new generation of food system thinkers and doers.

The NYFP model offers lasting benefits:

For students: Practical experience with planning, planting, budgeting, and harvesting, plus exposure to career pathways they may not have considered.

For schools: Access to funding, technical assistance, and tailored curriculum that integrates science, business, and agriculture.

For local farms: Stronger ties to schools, new market opportunities, and the chance to mentor young growers and future customers.

Through NYFP, rural students across Nebraska gained the tools and confidence to become the next generation of specialty crop producers, helping to grow a more local, sustainable, and inclusive future for Nebraska agriculture.

CAREERS IN NEBRASKA'S LOCAL FOOD MOVEMENT

Supporting career-connected learning through food, farming, and community

Teachers know that agriculture education isn't just about raising plants, it's about raising awareness, agency, and career readiness. The Nebraska Young Farmer Program (NYFP) helps bridge the gap between hands-on school garden projects and real career pathways in Nebraska's evolving local food system.

From greenhouse management to farmers market coordination, from culinary entrepreneurship to conservation planning, students encountered career models rooted in their communities, and gained the language, tools, and context to explore them meaningfully.

Real-World Career Connections, Rooted in Practice

These projects aligned with Nebraska Career & Technical Education pathways and the Agriculture, Food, and Natural Resources (AFNR) Career Cluster. They supported the following:

Food & Plant Production: Students created backward crop plans and managed greenhouse timelines, echoing the responsibilities of crop advisors, specialty crop farmers, and greenhouse managers.

Entrepreneurship & Agribusiness: Students sold mushrooms, plants and popcorn to their communities, gaining budgeting, pricing, and marketing experience in line with food product developers and market coordinators.

Culinary Arts & Nutrition: Projects tied into nutrition lessons, cafeteria tastings, and value-added product development, connecting directly to culinary arts, food science, and nutrition education careers.

Natural Resources & Conservation: Rangeland restoration, pollinator plantings, and compost management activities built pathways into environmental stewardship, conservation education, and technical roles.

Education & Outreach: Students designed signage, led tours, and documented growing projects, mirroring the work of farm-to-school coordinators, extension staff, and community educators.

Why It Matters for Career Readiness

Application of Academic Concepts: Students applied biology, environmental science, math, and communications in real-time, strengthening transfer of knowledge across disciplines.

Work-Based Learning, Scaled to Schools: Activities like harvest scheduling, soil testing, and product packaging mirror industry roles and timelines, giving students authentic responsibility without leaving campus.

Exposure to Nontraditional Ag Careers: Projects introduced students to agricultural and food system careers beyond row-crop production or mechanics, including roles in food access, pollinator conservation, education, and public health.

Equity in Access: By using scalable, replicable models, NYFP gave students in rural and underserved districts access to career-connected learning, with flexible entry points based on land access, facilities, and staff expertise.

Above:
Chokecherries help support habitat diversity and food sources for wildlife. Learn more about rangeland crops and biodiversity on page 37.

SPECIALTY CROP SPOTLIGHTS

Exploring Nebraska's Specialty Crops Production, Planning, and Purpose, Crop by Crop

The following pages highlight the specialty crops that students and teachers explored through the Nebraska Young Farmer Program. Each crop section includes real production planning tools, career tie-ins, budgeting examples, and reflections from Nebraska classrooms.

These aren't hypothetical lessons, they're based on what schools actually grew, harvested, and sold.

From popcorn and grapes to mushrooms and mixed vegetables, each crop offers unique opportunities for:

- **Hands-on learning** in greenhouses, raised beds, or rangeland
- **Cross-curricular connections** to science, math, nutrition, and entrepreneurship
- **Career exploration** in food systems, conservation, and local agriculture
- **Student leadership** through project ownership, peer teaching, and market preparation

Use these sections to:

- Plan a single crop from start to finish
- Compare growing conditions and production calendars
- Build classroom activities around planting, observation, or marketing
- Introduce students to real-world farming and food careers

These profiles are designed for flexibility, adapt them to your students, your site, and your teaching goals.

GRAPES

Image:
Brianna grapes, a type of wine grape that tastes like pineapple!

OVERVIEW

Grapes are a specialty crop gaining traction across Nebraska. While the state is not widely known for wine production, its climate supports cold-hardy grape varieties that thrive in our seasonal shifts. Grapes are typically grown for wine, juice, fresh eating, and value-added products like jams or jellies.

For schools, grapes offer a long-term perennial crop option that connects students to soil health, pruning, enterprise budgets, and harvest planning over several seasons.

NEBRASKA CLIMATE & GRAPE SUITABILITY

Nebraska's four distinct seasons and cold winters make it well-suited for growing cold-hardy grape varieties. Most vineyards in the state focus on cultivars that can tolerate late spring frosts, dry summer heat, and frequent wind exposure, all common across Nebraska's landscape.

POPULAR SEEDLESS & TABLE GRAPES FOR SCHOOL PROJECTS

- **Mars** – A seedless, blue-purple grape known for its sweet flavor and disease resistance. Great for fresh eating and small school gardens.
- **Himrod** – A yellow-green seedless variety with a mild, honey-like flavor. Early ripening and cold-tolerant, making it ideal for Nebraska zones.
- **Reliance** – A red seedless grape with a soft texture and high sugar content. Performs well in the Midwest and is popular for fresh snacks and freezing.
- **Vanessa** – A firm, crisp red seedless grape that holds well after harvest. Thrives in well-drained soil and works well in school settings with trellis systems.

In addition to selecting climate-adapted varieties, vineyard success in Nebraska depends heavily on soil health. Grapes prefer well-drained soils with neutral to slightly acidic pH. Many Nebraska growers manage sandy or clay-heavy soils by adding organic matter, monitoring pH, and improving drainage to promote strong root systems and balanced vine growth.

Grape Growing in Nebraska

Irrigation: Drip irrigation is preferred. It delivers water directly to roots and reduces disease pressure on leaves.

Pest & Disease Management: Grapes in Nebraska face pressure from Japanese beetles, black rot, and powdery mildew. Schools should explore IPM (Integrated Pest Management) strategies, including spacing vines for air circulation, using disease-resistant varieties, and scouting.

Pruning and Trellising: Annual dormant pruning is essential to balance vine vigor and crop load. Students learn to prune for airflow, shape, and future fruit production. Trellis design (like high-wire cordon) influences how grapes grow and how easily they're harvested.

Above: High-wire cordon is a form of trellis design for grape vines which helps support the grapes as they grow and encourages production.

PRODUCTION TIMELINE

Year 1

- **Site Preparation:** Clear land, test soil, and prepare rows
- **Planting of Grapevines**: Typically in late April through May
- **Installation of Trellising System**: High-wire cordon or VSP system installed by midsummer

Years 2–3

- **Vine Training and Canopy Management**: Students practice pruning techniques and train vines along the trellis
- **Minimal Harvesting**: Small harvests may begin in year 3 depending on vine health and variety

Year 4 Onwards

- **Full Harvest and Production Begins**: Students participate in full-scale harvest
- **Ongoing Tasks:**
  - » Annual dormant pruning (winter)
  - » Pest monitoring (spring–fall)
  - » Summer canopy management
  - » Fall harvest and cleanup

ENTERPRISE BUDGET (SAMPLE)

ITEM	ESTIMATED COST
Grapevines (bare root)	$400–600
Trellis materials (posts, wire)	$800–1,200
Irrigation system	$300–500
Soil amendments & mulch	$150
Labor (planting, training)	$300–600
Pest Control / disease management	$150–3-- annually
Tools (loopers, gloves, etc.)	$100 (many reusable)
Marketing / labeling materials	$100–200

Total Startup Costs (Year 1): ~$2,000–3,000
Annual Operating Costs (Years 2+): ~$300–600/year
Estimated Revenue (Year 4+): $1,000–2,000 annually (fresh grapes, U-pick, juice, or jelly)

Career Pathways in Viticulture

Vineyard Manager
Oversees vine health, soil fertility, irrigation, pest management, and harvest timing. Often holds a degree in viticulture, plant science, or horticulture.

Grape Breeder or Plant Scientist
Develops cold-hardy, disease-resistant grape varieties for regional climates.

Winemaker or Enologist
Manages the fermentation and aging process; requires deep knowledge of grape chemistry and sensory science.

Extension Viticulture Specialist
Provides education and support to growers on best practices, pest management, and variety selection.

Field Technician or Vineyard Assistant
Supports planting, trellising, canopy management, and data collection in research vineyards or commercial operations.

Nebraska's four distinct seasons and cold winters make it well-suited for growing cold-hardy grape varieties.

Classroom Integration Ideas

Agriscience & Plant Systems

- Create pruning diagrams and growth stage charts
- Use grape cluster weights to estimate yield and analyze data
- Explore soil testing and pH balancing for vine health

Entrepreneurship & Marketing

- Design vineyard signage and product labels
- Calculate revenue potential for grapes vs. table grapes or juice
- Develop a small-scale agritourism plan (e.g., tastings, tours, vineyard events)

FFA/CTE Programs

- Participate in viticulture science projects or agri-science contest entries
- Propagate vines from cuttings in a greenhouse setting
- Build trellis systems and monitor growth in raise beds or containers

What We Learned

- **Perennial crops require patience.** Students see how year-to-year planning and seasonal care impact future yields.
- **Trellis systems and pruning build technical confidence.** Students engaged deeply with tool use and long-term maintenance tasks.
- **Small-scale vineyards are big-picture tools.** Even a few vines give students a realistic view of how perennial crop systems fit into food, business, and climate discussions.

POPCORN

Image:
Popcorn comes in many colors, such as this red variety.

OVERVIEW

Popcorn is a student favorite and a strong educational tool. Unlike sweet corn, popcorn must be dried and cured before eating, giving students experience in harvesting, post-harvest handling, and processing. It's simple to grow in school gardens and brings opportunities for entrepreneurship and science integration. From planting to popping, popcorn creates a complete farm-to-table learning experience.

CLIMATE & GROWING CONDITIONS

Popcorn thrives in full sun and warm temperatures, with well-drained soil and consistent moisture during early growth and pollination.

- **Soil temperature**: 60°F minimum, ideally 70°F+ for germination
- **Spacing**: 8–10 inches between plants, 24–30 inches between rows
- **Soil type**: Loamy, well-drained; pH 6.0–7.5
- **Watering**: Weekly; avoid overwatering early or under-watering at tasseling
- **Pollination**: Wind-pollinated, plant in blocks, not single rows
- **Cross-pollination**: Avoid planting near sweet or field corn (500 ft. recommended)

PRODUCTION PLANNING & GROWING TIPS

1. **Choose Your Seeds**
   - » Select a variety suited for your climate and project goals. Popular types include:
     - Yellow Mushroom: large pop, good for flavoring
     - White Hull-less: smaller, tender pop
     - Blue or Red Popcorn: for visual appeal and value-added sales
2. **Prepare the Soil**
   - » Test for pH and nutrients
   - » Add compost or balanced fertilizer
   - » Avoid over-fertilizing with nitrogen
3. **Planting**
   - » Plant seeds 1–2 inches deep after frost has passed
   - » Use markers and string lines to maintain rows
   - » Allow for good airflow and sun access
4. **Maintain the Crop**
   - » Water weekly unless rainfall is consistent
   - » Weed regularly or apply mulch
   - » Monitor for pests: earworms, borers, and aphids can damage ears

Above:
A Lawrence-Nelson student places seed into a planter to prepare for planting popcorn.

5. Pollinate & Monitor Growth

- » Tasseling occurs around weeks 10–12
- » Keep other corn varieties away to preserve kernel quality
- » Observe for signs of nutrient stress or disease

6. Harvest When Ready

- » Wait for husks and stalks to turn brown and dry
- » Kernels should be hard, but not brittle
- » Harvest typically occurs 90–120 days after planting

POST-HARVEST HANDLING & STORAGE

Proper drying is key to popcorn quality. Popcorn should reach 13–14% moisture for optimal popping.

Drying Process

- Air-dry ears for 1–2 weeks in a well-ventilated space
- Test by popping a small sample, if it doesn't pop well, it may be too wet or too dry
- If too dry, store kernels with a damp paper towel in a sealed container for 24–48 hours to rehydrate slightly

Storage Tips

- Once dried, shell the kernels by hand or with a corn sheller
- Store in airtight containers in a cool, dry place
- Properly stored kernels can last 12 months or more

Right:
Popcorn being planted at Lawrence-Nelson school.

ENTERPRISE BUDGET SNAPSHOT (PER 100 SQUARE FEET)

ITEM	ESTIMATED COST
Seeds (1 lb)	$5–20
Fertilizer & compost	$10–50
Mulch (optional)	$10–20
Basic tools & equipment	$50–100 (one-time cost)
Drip irrigation (optional)	$30–100
Pest control	$10–15
Packaging (bags, labels)	$5–20

Revenue Potential:

- ~10 lbs popcorn per 100 sq. ft.
- $3–5/lb for bulk kernels
- $8–12/lb for flavored or bagged popcorn
- Potential income: $30–120 depending on market and format

CAREERS IN POPCORN PRODUCTION

Agricultural Careers

Popcorn Farmer
Manages seed selection, planting, and harvest

Agricultural Technician
Supports research on improved popcorn varieties

Crop Scientist
Studies traits like expansion ratio and disease resistance

Food & Marketing Careers

Product Developer
Creates flavored popcorn blends and snack innovations

Marketing Specialist
Develops packaging and brand strategies for popcorn products

Farmers Market Coordinator
Sells directly to consumers and promotes school-grown products

VALUE-ADDED OPPORTUNITIES

Popcorn lends itself to creativity, from recipes to product design.

Ideas for Schools and Students

- **Flavored Popcorn** – Use ranch, cinnamon, caramel, or chili lime
- **DIY Popcorn Kits** – Kernels + seasoning + recipe card
- **Gift Sets** – Include locally grown popcorn, stickers, or school branding
- **Popcorn in the Cafeteria** – Showcase student-grown food during Nebraska Thursdays

SAMPLE POPCORN PRODUCTION CALENDAR

MONTH	ACTIVITY
April	Finalize seed order, prepare soil, test pH and nutrient levels
May	Plant seeds once soil reaches 60–70°F; label rows; begin watering routine
June	Weed weekly, apply mulch, monitor early growth and pest pressure
July	Monitor tasseling and pollination; maintain water during hot weather
August	Watch for maturing ears; reduce watering as plants begin to dry
September	Harvest when husks are brown and ears feel firm; begin air-drying
October	Shell kernels and test moisture; begin packaging and value-added projects
November	Sell products at school events, markets, or as fundraisers

Tips for Success

- **Choose the right seed:** Match your variety to your climate and project goals (bulk sales, flavored bags, or kits).
- **Wait for warm soil:** Popcorn germinates best when soil is at least 60–70°F.
- **Avoid cross-pollination:** Keep at least 500 feet between popcorn and other types of corn.
- **Water consistently:** Especially during germination and tasseling, uneven moisture can affect kernel quality.
- **Plan for pests:** Use organic pest control or companion planting (like beans or marigolds) to reduce damage.
- **Dry completely:** Let ears dry on the stalk and then cure indoors until moisture is 13–14%.
- **Integrate into your SAE:** Popcorn is a great crop for recordkeeping, budgeting, marketing, and value-added SAE projects.
- **Test before packaging:** Always pop a sample batch to ensure quality before selling or distributing.

Industry Organizations for Popcorn Producers

Nebraska Popcorn Association

Supports Nebraska's popcorn growers through education, marketing, and research. Great resource for student projects and Nebraska-specific growing tips.

nebraskapopcorn.com

The Popcorn Board

National organization providing recipes, nutrition facts, and popcorn growing information for schools and producers.

popcorn.org

FROM PLANTING TO POPPING, POPCORN CREATES A COMPLETE FARM-TO-TABLE LEARNING EXPERIENCE.

MUSHROOMS

Image:
Oyster Mushrooms ready for harvest.

OVERVIEW

Mushroom production offers a unique opportunity for schools to explore a highly sustainable and profitable agricultural venture. Unlike traditional crops, mushrooms can be grown indoors using kits or controlled environments, making them ideal for classrooms, greenhouses, or even school labs. They grow fast, require minimal space, and allow students to track results in real time.

Popular varieties in Nebraska school settings include oyster, shiitake, and lion's mane, all of which are well suited for indoor kits and small-scale production.

CLIMATE & GROWING CONDITIONS

Mushrooms grow best in humid, cool environments and do not require direct light or soil.

Key growing needs:

1. Temperature: 55°F to 70°F (depending on species)
2. Humidity: 80–90%, maintained with misting or a humidifier
3. Light: Low or indirect light (no direct sunlight)
4. Substrate: Straw, sawdust, coffee grounds, or compost mix
5. Containers: Kits, plastic grow bags, trays, or buckets

PRODUCTION PLANNING FOR SCHOOLS

Follow this guide to grow mushrooms in your school using kits or basic indoor setups. Most schools start with oyster mushroom kits due to their reliability and quick harvest cycle.

1. Source Your Spores or Kits

» Choose a mushroom kit or purchase spores from a reliable supplier. Oyster mushroom kits are a popular choice because they're easy to grow and can yield multiple flushes throughout the year. Look for high-quality spawn to increase your success rate, avoid discount or unknown sources.

2. Prepare the Substrate

» If you're using a kit, the substrate is usually pre-inoculated and ready to use. Some may need to be soaked in water for 24 hours before starting. If you're preparing your own substrate (such as straw or sawdust), you'll need to pasteurize it by heating to eliminate contaminants and give the spores a clean environment to grow.

3. Inoculate and Activate

» In most kits, this step is already done,the spores are mixed into the substrate. To activate the growing process, place the kit in a dark, humid area where the mycelium (the fungal "roots") can spread and colonize the material.

4. Set Up the Incubation Area

» Mushrooms need a stable, humid space for incubation. Choose a dark area with 80–90% humidity and a temperature between 55°F and 65°F. Mist the area daily and cover the kit with plastic if needed to retain moisture. Monitor regularly to ensure the environment stays consistent.

5. Move to Fruiting Conditions

» After 1–3 weeks, when the substrate is fully colonized, move the kit into an area with indirect light. This signals the mushrooms to begin fruiting. Continue misting daily and provide light airflow. Look for “pins”, tiny baby mushrooms, as the first sign of success.

6. Harvest the Mushrooms

» Once mushrooms are fully formed, gently twist them off at the base. Avoid cutting too deeply or damaging the block so it can produce additional harvests, known as “flushes.” Most kits will produce 2–3 flushes before they’re spent.

7. Post-Harvest Management

» Compost the old substrate once it stops producing, or keep it moist to try for another flush. For a continuous supply, start a new kit every 2–4 weeks,staggered plantings ensure you always have something growing or ready to harvest.

Above:
Overton students learn about mushroom cultivation from their farmer mentor during a field trip to the farm.

SAMPLE MUSHROOM PRODUCTION CALENDAR

MONTH	WEEK	ACTIVITIES
AUGUST	Week 1–2	- Source mushroom kits and prep growing space - Activate substrate (soak/mist) - Set up incubation (dark, humid, 55–65°F)
	Week 3–4	- Mycelium colonization begins - Monitor humidity and temperature daily
SEPT	Week 1	- Move kits to fruiting conditions (indirect light) - Watch for pinning
	Week 2–3	- Harvest Batch 1 - Teach proper harvest techniques - Start Batch 2
	Week 4	- Second flush from Batch 1 - Incubate Batch 2
OCT	Week 1–2	- Harvest Batch 2 - Start Batch 3
	Week 3–4	- Second flush from Batch 2 - Incubate Batch 3
NOV	Week 1	- Harvest Batch 3 - Start Batch 4
	Week 2–3	- Second flush from Batch 3 - Incubate Batch 4
	Week 4	- Harvest Batch 4 - Start Batch 5 - Prep area for winter break
DEC	Week 1–2	- Second flush from Batch 4 - Reduce misting, slow production
	Week 3–4	- **Winter Break**: Pause production, minimal maintenance

MONTH	WEEK	ACTIVITIES
JAN	Week 1	- **Winter Break continues**
	Week 2	- Harvest Batch 5 - Start Batch 6
	Week 3–4	- Harvest Batch 6 - Prep for flush from Batch 5
FEB	Week 1–2	- Start Batch 7 - Second flush from Batch 6
	Week 3–4	- Harvest Batch 7 - Incubate Batch 8
MARCH	Week 1–2	- Start Batch 9 - Continue harvesting
	Week 3–4	- Harvest Batch 8 - Prep second flush - Incubate Batch 9
APRIL	Week 1	- Start Batch 10 - Harvest Batch 9
	Week 2–3	- Second flush from Batch 9 - Harvest Batch 10
	Week 4	- Final flushes - Prep for end-of-year wrap-up
MAY	Week 1–2	- Start Batch 11 (if needed) - Final harvests
	Week 3–4	- Clean up growing space - Compost spent substrate - Student review & reflection

ENTERPRISE BUDGET EXAMPLE

Revenue Potential:

- Fresh mushrooms: $8–$12 per pound
- Dried or powdered: $4–$10 per ounce
- Value-added items (like seasonings or mushroom jerky): Pricing varies depending on ingredients and packaging

CLASSROOM TIE-INS

Subject Areas & Activities:

- **Biology** – Study the life cycle of fungi, mycelium formation, and fruiting
- **Environmental Science** – Discuss composting, decomposition, and sustainable food systems
- **Math** – Track harvest weights, flush yields, and calculate basic budgets
- **STEM** – Design growing environments, build misting setups, and monitor humidity
- **Culinary Arts** – Run taste tests, dry mushrooms, and explore recipes for cafeteria use

CAREERS IN MUSHROOM PRODUCTION

Production & Growing

Mushroom Farmer
Grows mushrooms commercially or at a small scale for markets, restaurants, or CSA programs

Farm Manager
Oversees mushroom production in indoor or outdoor settings, including staff and infrastructure

Mycology Technician
Works in labs or production facilities inoculating, growing, and maintaining mushroom cultures

Science & Research

Mycologist
Studies fungi in scientific or medical contexts, often involved in developing new mushroom strains or studying soil fungi

Soil Scientist
Researches soil and organic matter interactions, including fungi's role in ecosystems and agriculture

Agricultural Researcher
Develops improved growing methods, pest control strategies, or new mushroom-based products

Culinary & Value-Added

Food Product Developer
Creates mushroom-based products like jerky, powders, seasoning blends, or prepared foods

Culinary Educator or Chef
Specializes in mushroom-based cooking and recipe development

Preservation Specialist
Focuses on drying, fermenting, or freezing mushrooms for extended shelf life

Sales & Entrepreneurship

Farmers Market Vendor
Grows and sells fresh mushrooms directly to customers

Agricultural Marketer
Develops packaging, branding, and sales strategies for mushrooms and mushroom products

CSA or Subscription Box Manager
Includes mushrooms in seasonal boxes or delivers direct to customers

Environmental & Alternative Careers

Compost Specialist
Uses spent mushroom substrate in compost or regenerative farming systems

Mushroom Forager (with permits)
Collects wild mushrooms for culinary or medicinal use, ensuring safety and sustainability

Medicinal Mushroom Grower
Focuses on functional fungi like lion's mane or reishi for wellness markets

SUCCESSES IN SCHOOL SETTINGS:

- Fast-growing and visually engaging,great for younger learners
- Suitable for indoor learning year-round
- Appeals to students interested in science, sustainability, and food

Common Challenges:

- Requires cleanliness to avoid mold or contamination
  Maintaining proper humidity can be tricky in winter months

Helpful Tips:

- Use observation or harvest logs to track flushes
- Start a new batch every 3–4 weeks to keep production continuous
- Experiment with drying and powdering for added learning and sales opportunities

INDUSTRY RESOURCES

North American Mycological Association (NAMA)

Offers education, ID guides, and foraging safety tips

namyco.org

The American Mushroom Institute (AMI)

Trade association representing the growers, processors and marketers of cultivated mushrooms in the United States and industry suppliers worldwide.

americanmushroom.org

UNL Extension – Specialty Crops

Local support for Nebraska growers and educators

extension.unl.edu

Right:
Mushrooms can be grown in a variety of containers or found objects.

GOATS

Image:
A Doe Boer raised at Oakland-Craig School watches over her young kids.

OVERVIEW

Goats offer a unique opportunity to explore animal agriculture in a way that's accessible, interactive, and deeply rooted in Nebraska's history of livestock production. Goats are ideal for school-based learning, they're smaller than cattle, curious by nature, and excellent teachers when it comes to understanding animal behavior, breeding, and pasture systems.

Goat production fits neatly into FFA and 4-H animal science tracks, supports discussions on sustainable grazing and conservation, and introduces students to value-added farm products like soap and fiber. A great way to incorporate goats into your classroom learning is by partnering with an FFA student who is raising goats for their SAE project, allowing you to share responsibilities—especially during school breaks when the animals still require care. Goats connect the classroom to real-world agricultural careers and entrepreneurship.

NEBRASKA'S CLIMATE AND SUITABILITY FOR GOATS

Goats are well-suited to Nebraska's climate, thriving in both the cold winters and hot, humid summers with the right management. In colder months, they do well with proper shelter, dry bedding, and protection from wind. During the summer, shade structures and access to clean, cool water help them stay comfortable and productive.

In terms of land use, goats are adaptable and can thrive on a variety of pasture types. They're especially useful for managing brush and invasive weeds, making them a great fit for land that isn't ideal for row crops. Schools can utilize pasture, dry-lot setups, or a mix of both depending on available space and resources, making goat projects accessible even on smaller or less traditional ag sites.

Choosing Goat Breeds for School Programs

Goat breeds vary widely in size, temperament, and purpose. When selecting a breed for your school, consider your educational goals, the amount of space available, and the experience level of your students. Below are several popular breeds that work well in youth agriculture and classroom settings.

Boer (Meat Breed)

Boer goats are large, muscular animals bred primarily for meat production. They grow quickly and have a calm temperament, especially with regular handling. These goats are a great choice for teaching market animal evaluation, feed conversion, and general livestock care. Because of their size, Boers provide excellent hands-on opportunities for practicing health checks and handling skills. However, they do require more space and feed than smaller breeds, so planning ahead is important.

Nubian (Dual-Purpose: Milk & Meat)

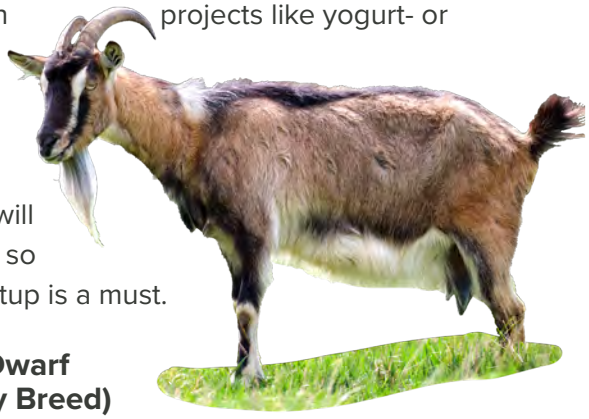
Nubians are known for their long ears, strong personalities, and high-butterfat milk, which is ideal for cheese, lotion, or soap making. They are vocal and highly social, making them a fun and engaging choice for students. Nubians are well-suited for value-added product projects and introducing dairy management practices. Just be aware,their loud voices and occasional stubborn streak might surprise new handlers.

LaMancha (Dairy Breed)

LaManchas are calm, sweet-natured goats recognized by their tiny “gopher ears.” They’re steady milk producers with a mild, sweet flavor, and their easy going temperament makes them a favorite in classroom settings or with beginner students. LaManchas are especially good for hand-milking demos and animal observation. While they’re not as flashy as other breeds, they’re a quiet, dependable option that might need extra storytelling or marketing if used in student-run sales.

Alpine (Dairy Breed)

Alpines are alert, energetic goats known for producing large volumes of milk, though with slightly lower butterfat. They’re highly adaptable and do well in varied climates, making them a solid all-around dairy choice. Alpines can tie into food science lessons with projects like yogurt- or cheese-making. However, they are clever and will test fences, so a secure setup is a must.



Nigerian Dwarf (Mini Dairy Breed)

Nigerian Dwarf goats are small but mighty milkers. Their milk has very high butterfat content,sometimes up to 10%, which is perfect for rich cheeses or soaps. They’re playful and sociable, and their small size makes them easy for younger students to handle. These goats are a strong option for limited spaces and small-scale budgeting or hand-milking activities. They do require close care and supervision, as they are more delicate than larger breeds.

Pygmy (Pet/Companion Breed)

Pygmy goats are compact, friendly, and often used in education, therapy, or showmanship. Though not productive for meat or milk, they are excellent for helping students build confidence in animal handling, barn chores, or event demonstrations. Their charm and approachability make them a favorite for school events and early animal science classes.

Angora (Fiber Breed)

Angora goats are raised for their long, silky mohair fiber, which is used in textile and craft projects. These goats need to be sheared twice a year, offering students a hands-on introduction to fiber production and fiber arts. Programs can extend into carding, felting, and spinning activities that connect animal science with textile or art classes. Angoras require extra grooming and shelter, especially after shearing, but they provide a unique and creative learning opportunity.

GOAT PRODUCTION PLANNING FOR SCHOOLS

Raising goats in a school setting involves planning for housing, feeding, health, and student engagement. Whether your program runs year-round or seasonally, the following plan can help structure your school's goat project for success.

Seasonal Planning Overview

Spring (March–May)

- Prepare housing: Clean pens, set up bedding, inspect fencing
- Begin rotational grazing if pasture is available
- Trim hooves and check body condition
- If breeding, monitor does for signs of kidding (birth)
- Bottle-feed or manage kid care if babies are born

Summer (June–August)

- Maintain shade structures and fresh water access
- Monitor for parasites and heat stress
- Begin milking if using dairy breeds
- Weigh animals and track feed conversion (great student math tie-in)
- Consider FFA and 4-H projects or student volunteers

Fall (September–November)

- Transition to dry-lot or winter setup as pastures fade
- Schedule vet checkups or vaccinations
- If breeding, manage buck exposure and pregnancy confirmation
- Trim hooves before cold weather sets in

Winter (December–February)

- Provide dry bedding and windbreaks or enclosed shelter
- Adjust feed to include hay and possibly grain for energy
- Check water systems to prevent freezing
- Use this time for classroom lessons: nutrition, budgeting, anatomy, or value-added product development
- If using fiber goats (e.g., Angoras), plan for early spring shearing prep

Above:
Oakland-Craig students pose for a photo with their young goat kids.

DAILY & WEEKLY TASKS

FREQUENCY	TASKS
Daily	Feed, water, visual health check, clean shelter, social interaction
Weekly	Refill minerals, clean troughs, check hooves, weigh feed use
Monthly	Track growth/weight, perform full health check, update records

Classroom Integration Ideas

- **Science** – Digestive systems, breed traits, parasites, and soil impact from grazing
- **Math** – Budget feed costs, weigh animals, calculate feed efficiency
- **Entrepreneurship** – Sell soap, lotion, compost, or develop marketing plans
- **FFA/SAE Projects** – Perfect for supervised ag experiences tied to career readiness

ENTERPRISE BUDGET EXAMPLE: SMALL-SCALE GOAT PROJECT

Goat projects can be tailored to your school's space, goals, and student interests. Whether raising kids for sale, producing milk for soap, or using goats for educational outreach, students can track real costs and revenue to understand what it takes to run a small livestock enterprise.

Revenue Potential

- **Kids for Sale**: A healthy goat kid can sell for $100–$200, depending on breed and age. Boer and meat-type kids often bring higher prices at local markets or 4-H and FFA sales.
- **Goat Milk Soap**: Using milk from dairy breeds like Nubians or Nigerian Dwarfs, students can produce handmade soap. Each bar can sell for $4–$6 at school events or local markets, especially with custom labels or scents.
- **Educational Demos & Outreach**: While not a direct revenue stream, bringing goats to school or community events offers value through visibility, student confidence-building, and community engagement.

Sample Budget Snapshot (Per Year, 2 Goats + 2 Kids)

ITEM	ESTIMATED COST
Feed (hay, grain, minerals)	$300–400
Bedding & supplies	$75–100
Veterinary care (vaccines, deworming)	$75–150
Equipment (fencing, buckets, milk stand)	$300–500 (initial setup)
Soap-making supplies (oils, molds, labels)	$50–100
Marketing materials (signs, labels)	$25–50

Estimated Revenue:

- 2 goat kids sold: $200–400
- 30–50 soap bars: $120–300
- Community demos: Add value to grant reports, FFA outreach, and school partnerships

Student Learning Opportunity

Students can create their own enterprise budgets by estimating:

- Initial and recurring costs (feed, shelter, tools)
- Projected sales or community impacts
- Break-even points and profitability timelines

This exercise works well for SAE projects, business classes, or science/math crossover lessons. Encourage students to track actual expenses, explore pricing, and consider how marketing or breed selection influences their outcomes.

CAREER PATHWAYS IN GOAT PRODUCTION

Goats can connect students to a wide variety of career opportunities across animal systems, environmental management, and entrepreneurship. These pathways highlight both hands-on roles and supporting careers in science, business, and education.

Animal Systems Careers

Students interested in animal care and health might explore careers like:

Goat Farmer or Herd Manager
Oversees breeding, feeding, and herd health

Veterinarian (small or large animal)
Provides medical care and preventative treatment

Livestock Nutritionist
Develops feed plans and supplements for optimal health

Extension Educator
Teaches producers and communities about best practices in goat care and production

Natural Resources & Conservation

Goats play a role in sustainable land use and habitat restoration. Related careers include:

Range Technician
Manages grazing systems to prevent overuse and promote regrowth

Wildlife and Habitat Specialist
Incorporates goats into brush and invasive plant control programs

Entrepreneurship & Marketing

Creative, business-minded students can build careers around:

Farmer
Runs a diversified operation with meat, dairy, or fiber goats

Soap or Fiber Product Developer
Uses milk or mohair for value-added items

Farmers Market Vendor
Sells goat products locally with a focus on branding and customer relationships

Agricultural Influencer
Shares educational or behind-the-scenes content online

Career Exploration Tool

Students can explore these and related roles at AgExplorer.FFA.org, which allows filtering by interests (animals, outdoor work, business) and education levels.

EDUCATIONAL TIE-INS

Goat projects easily connect to existing curriculum and student organizations like FFA and 4-H, offering both classroom and extracurricular learning opportunities.

FFA & 4-H Integration

- Maintain record books for feed, health, and breeding
- Participate in showmanship, judging contests, and public speaking
- Lead project tours or teach peers about animal handling and care

Curriculum Connections

- **Animal Science** – Anatomy, nutrition, and reproduction
- **Agribusiness** – Enterprise budgeting, marketing, and sales
- **Ag Mechanics** – Build fencing, shelters, and irrigation systems
- **Environmental Science** – Grazing management, soil health, and erosion control

Hands-On Classroom Projects

- Create a seasonal goat production calendar
- Make goat milk soap or lotion as a value-added business project
- Design flyers or social media content to market kids during kidding season

HOW SCHOOLS USED GOATS

In the NYFP project, goat production was introduced at Oakland-Craig Public Schools as part of an integrated livestock and land management plan. Students participated in planning breeding schedules, built fencing, and learned proper handling techniques.

Lessons Learned and Sustainability

Lessons from the Field

Raising goats in a school setting has proven to be both rewarding and educational. Key takeaways from participating schools include:

- Goats require daily care, making them ideal for teaching routine, responsibility, and animal husbandry
- Breeding adds complexity, but also increases student engagement through birthing, recordkeeping, and kid care
- Community partnerships,with local farmers, feed stores, or veterinarians, can provide support, reduce costs, and help with marketing or animal sales

Sustainability Strategies

To keep school-based goat projects running successfully year after year, schools can:

- Use goats as a hands-on learning tool across science, ag, and leadership classes
- Expand into value-added products like soap or lotion to showcase student work at school events and fundraisers
- Consider companion plantings, such as pollinator pastures or native species areas, to enhance land use and conservation learning

INDUSTRY ORGANIZATIONS AND RESOURCES

Nebraska Sheep and Goat Producers Association (NSGPA)

NSGPA supports local producers through networking, education, and events. It's a valuable resource for schools interested in regional contacts and on-the-ground advice.

nebraskasheepandgoat.org

ATTRA Sustainable Agriculture – Goat Resources

This national clearinghouse offers practical guides and videos on sustainable goat production, pasture planning, and value-added marketing,great for teachers and students alike.

attra.ncat.org

National FFA – Animal Systems Career Pathway

FFA's animal systems pathway connects students with hands-on learning, competitions, and career exploration focused on animal science, including small ruminants like goats.

ffa.org

RANGELAND

OVERVIEW

Rangelands cover more than half of Nebraska's land area and play a vital role in both agriculture and conservation. They support livestock production, protect soil health, preserve native plant species, and provide habitats for wildlife and pollinators. For students, rangeland projects offer an engaging way to study ecosystems, grazing management, and restoration practices.

Through the Nebraska Young Farmer Program (NYFP), schools explored rangeland planning as a living laboratory-bringing together soil science, climate resilience, wildlife conservation, and long-term land stewardship.

NEBRASKA'S CLIMATE AND RANGELAND SUITABILITY

Nebraska's landscape, shaped by dry summers, cold winters, and open plains, provides ideal conditions for native grassland ecosystems. However, many of these prairies have been degraded by overgrazing, invasive species, and land development. Through school-based restoration projects, students can play an active role in rebuilding and protecting these important ecological areas.

Key Features of Nebraska Rangeland

Rangelands in Nebraska include a rich mix of grasses, flowering plants, and shrubs that are adapted to local conditions:

- **Native Grasses**: Big bluestem, little bluestem, switchgrass, and sideoats grama form the backbone of healthy prairie systems.
- **Forbs (Flowering Plants)**: Species like purple coneflower, black-eyed Susan, and milkweed support pollinators and biodiversity.
- **Shrubs and Trees**: Sand cherry, chokecherry, and wild plum add habitat diversity and food sources for wildlife.
- **Soils**: Often sandy loam or clay, Nebraska's rangeland soils are typically low in organic matter but respond well to careful management and restoration efforts.

Right:
Native flowering plants such as milkweed (left) and coneflower (right) help support pollinators and biodiversity.

PROJECT PLANNING EXAMPLE: SCHOOL-BASED RANGELAND RESTORATION

Schools across Nebraska can restore native grassland areas as outdoor classrooms, pollinator habitats, and community demonstration sites. This example outlines a full-year plan for rangeland restoration, adaptable to different regions and resource levels.

Seasonal Restoration Plan

FALL PLANNING PHASE	
August	Begin with a site assessment and soil testing. Identify invasive species and plan removal.
September	Prepare the soil by loosening compacted areas and adding compost. Assess drainage and install basic erosion control features.
October–November	Add infrastructure such as mulch trails, interpretive signs, and perimeter fencing. Fall is also a good time to plant trees and hardy perennials.
WINTER MAINTENANCE	
December–February:	Add mulch for insulation, protect young plants from wind or snow, and check that fencing and signage are intact. Use this time to plan spring planting and finalize seed orders.
SPRING IMPLEMENTATION	
March–April	Seed native grasses and wildflowers once the soil is workable. Consider using a broadcast seeder or hand-spreading with student groups.
May	Finalize infrastructure touches, conduct a walkthrough to assess success, and invite the community to see the project.
ONGOING MAINTENANCE	
Summer–Fall	Water as needed during establishment (especially year one). Replant or reseed any failed areas. Host learning events, take plant inventories, and integrate the site into agriculture, science, or environmental studies curriculum.

Common Challenges & Solutions

Challenge: Ensuring plant survival in dry or cold conditions
Solution: Time planting windows carefully and use mulch to conserve moisture and protect roots

Challenge: Keeping students engaged during the off-season
Solution: Create rotating maintenance teams and tie site care into science or leadership class routines

Challenge: Balancing ecological function with school appearance
Solution: Involve art and science students in designing attractive, informative signage and plant guides

Plant Selection and Purpose

Nebraska schools span multiple growing zones, but all can benefit from using a mix of native grasses, forbs (wildflowers), and shrubs that support pollinators, soil health, and biodiversity. Choose species based on your region (Sandhills, tallgrass prairie, loess hills, etc.), sunlight availability, and moisture level.

Recommended Plant Categories:

Grasses:

- *Big Bluestem*: Tall, drought-tolerant, foundational prairie grass
- *Little Bluestem*: Compact, colorful, and excellent for wildlife
- *Sideoats Grama*: Attractive seed heads, great for dry areas
- *Switchgrass*: Useful in wetter zones or runoff control areas

Forbs (Wildflowers):

- *Purple Coneflower*: Easy to grow, long bloom, great for pollinators
- *Black-eyed Susan*: Hardy and fast-growing
- *Milkweed* (various types): Supports monarch butterflies
- *Golden Alexanders*, *Prairie Clover*, and *Asters*: Great for diversity and seasonal blooms

Shrubs/Trees:

- *Wild Plum*, *Chokecherry*, *Sand Cherry*: Native fruiting shrubs that provide habitat and food for birds and pollinators
- *Hackberry* or *Bur Oak*: Long-lived shade and structure trees (plant early and protect)

Tip: Use a seed mix from a regional native seed provider, like Prairie Legacy (prairielegacyinc.com), and consult your local NRCS or Extension office for zone-specific recommendations.

Above:
Switchgrass has deep roots that improve soil structure, enhance water infiltration, and help prevent soil erosion.

ENTERPRISE BUDGET CONSIDERATIONS FOR RANGELAND PROJECTS

Establishing and maintaining a rangeland restoration site can be cost-effective, especially when schools take advantage of cost-share programs, community partnerships, and in-kind donations. Students can use these projects to build practical budgeting skills while learning about conservation funding models.

Common Expenses

While many items can be sourced locally or donated, schools should plan for the following potential costs:

- Native seed mix (grasses, wildflowers, and shrubs)
- Compost or soil amendments
- Mulch, straw, or erosion control fabric
- Watering equipment (hoses, barrels, drip line)
- Fencing or signage
- Trail materials (woodchips, gravel, or edging)

Funding Sources and Partnerships

Many Nebraska conservation groups and agencies offer support for projects that promote native species, pollinator habitat, or soil health.

- **Cost-Share Programs**: NRCS EQIP, Game and Parks Habitat Partnerships, and county conservation districts may cover part of seed, planting, or infrastructure costs
- In-Kind Donations: Local NRDs (Natural Resources Districts), FFA alumni groups, and conservation nonprofits often donate mulch, seeds, compost, signage, or volunteer hours
- Grants: Look for small-scale environmental education grants from local foundations, the Nebraska Environmental Trust, or the Nebraska Statewide Arboretum

Student Budgeting Tie-In

Students can create simple enterprise budgets for the rangeland area, estimating startup costs, projecting long-term savings (e.g., reduced mowing, erosion control), and calculating the value of educational use. This provides a real-world application of budgeting skills and encourages grant-writing or project proposal practice.

CAREER CONNECTIONS: RANGELAND & CONSERVATION

Rangeland restoration projects help students build hands-on experience in ecology, land management, and community engagement,all of which connect directly to career pathways in agriculture, conservation, and education. These experiences support future job skills, strengthen FFA and 4-H involvement, and open the door to internships and early career exploration.

Natural Resource Pathways

Students who enjoy working outdoors, managing land, or helping the environment may be drawn to roles such as:

Rangeland Ecologist – Studies native plant communities and their response to grazing or restoration

Conservation Planner – Develops long-term strategies for habitat improvement and land use

Wildlife Biologist – Works with species impacted by prairie loss and fragmentation

Grazing Land Specialist – Helps farmers and ranchers manage grasslands for productivity and sustainability

NRCS Technician or Advisor – Works directly with landowners to implement conservation practices.

Education & Communication Careers

For students who love teaching, storytelling, or working with the public, rangeland projects build strong foundations in:

Environmental Education – Teaching ecological principles in schools, nature centers, or museums

Extension Work – Supporting farmers, ranchers, and youth through research-based education

Outdoor Interpretation – Designing trail guides, educational signage, or leading field tours

Science & Environmental Exploration

Classroom tie-ins can spark early interest in environmental and scientific careers through:

Pollinator Studies – Tracking insects, analyzing habitats, and planting nectar species

Soil Health Labs – Testing structure, moisture, pH, and organic matter before and after restoration

Erosion & Water Labs – Modeling runoff, testing water retention, and mapping land contours

FFA, 4-H & Ag Ed Programs

Many schools expand their rangeland work through existing youth leadership and agriculture programs:

Land Judging and Soils Contests – Evaluate land use, slope, and erosion factors

Wildlife Habitat Evaluation Program (WHEP) – Assess plant communities and food sources for wildlife

Chapter Gardens or Plant Showcases – Feature native plant plots at school or community events

Range Boards – Can be submitted for 4-H and FFA at County and State Fair

PROJECT-BASED LEARNING IDEAS

Encourage ownership and creativity with student-led projects such as:

- Creating custom plant ID guides with photos and descriptions
- Designing educational signage for campus trails or gardens
- Organizing community planting days or hosting an Earth Week event

LONG-TERM OPPORTUNITIES

Once established, rangeland restoration areas can evolve into multifunctional learning sites:

- Add walking paths with plant ID signs or QR code tours
- Host range judging practice or habitat evaluation events
- Collaborate with local NRDs or conservation groups for seed, signage, or technical help
- Pair the site with a pollinator patch or native garden for additional curriculum tie-ins

RESOURCE CONNECTIONS

Nebraska Grazing Lands Coalition
Technical help and school support
nebraskagrazinglands.org

UNL Range Management Program
Outreach and student training
agronomy.unl.edu

Nebraska Game & Parks Pollinator Habitat Initiative
Tools and funding
outdoornebraska.gov

Society for Range Management
Curriculum, youth contests, and educator resources
rangelands.org

Pheasants Forever / Quail Forever
Habitat grants and planting guides
nebraskapf.com

VEGETABLES
(WITH CUT FLOWERS)

OVERVIEW

Vegetables and cut flowers are at the core of most school-based growing programs. They offer students the chance to grow, observe, taste, and share what they've produced. These crops also allow students to participate in the full agricultural cycle - from planning and planting to harvest and market.

In the NYFP program, schools used raised beds, high tunnels, and greenhouses to grow tomatoes, herbs, salad greens, and flower bouquets. These projects led to school taco nights, vegetable taste tests, and even student-led sales of fresh-cut flowers and produce.

NEBRASKA CLIMATE AND SUITABILITY FOR VEGETABLE & FLOWER PRODUCTION

Nebraska's climate offers a productive growing season from roughly April to October. However, cold winters and unpredictable late spring or early fall frosts can shorten the outdoor planting window. Many schools overcome these limitations by using greenhouses or high tunnels, which allow for early seeding, season extension, and more consistent harvests.

In school-based programs, crops are often selected for fast maturity, student interest, and cross-curricular tie-ins. Popular options include:

- **Cool-season vegetables**: Lettuce, radishes, peas, spinach, and kale thrive in early spring or fall conditions. These are ideal for shorter semesters or greenhouse starts.
- **Warm-season crops**: Tomatoes, cucumbers, peppers, and squash are typically transplanted in late May and grow well through summer or in protected environments.
- **Cut flowers**: Zinnias, sunflowers, snapdragons, and strawflowers are easy to grow, highly visual, and excellent for farmstand sales or school bouquets.

Many schools also integrate herbs like cilantro and basil, or small fruits such as strawberries, to create diverse growing experiences. These crops lend themselves to planning, journaling, culinary activities, and classroom taste tests, giving students a full seed-to-plate experience.

HOW TO BACKWARD PLAN: A STEP-BY-STEP GUIDE FOR GARDEN SUCCESS

Backward crop planning helps you figure out exactly when to plant your seeds so your vegetables or flowers are ready for a specific event, like a taco party, salad day, farmers market, or bouquet sale.

Materials You'll Need

- A calendar (paper or digital)
- A seed packet or seed catalog (like Johnny's or Seed Savers)
- A pencil or pen
- A notebook or garden journal
- Optional: Colored pencils to mark seed starting, transplanting, and harvest dates

Step-by-Step Instructions

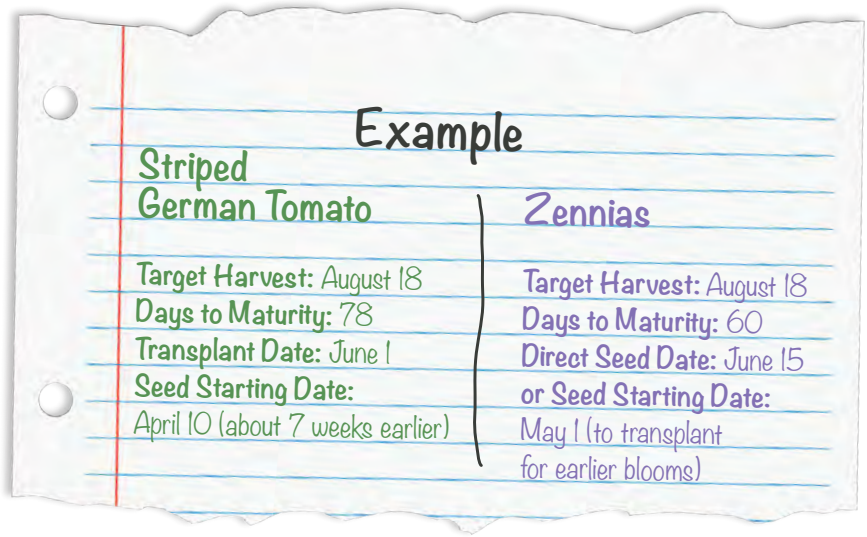
1. **Pick Your Harvest Date –** Choose when you want your crop to be ready. This could be tied to a class event, market weekend, or the end of the school year. Mark that harvest date clearly in your calendar.

2. **Look Up the Days to Maturity (DTM)** – Find the DTM on your seed packet or in the seed catalog. This number tells you how long it takes for a plant to grow from planting to harvest.
   - » For direct-seeded crops (like radishes or cilantro), DTM starts when you plant seeds outside.
   - » For transplants (like tomatoes), DTM starts when you move them from trays into the garden.

3. **Count Backward to Find Your Planting or Transplanting Date** – Using your calendar, count backward from your harvest date based on the DTM.
   - » That date becomes your transplant date (for crops like tomatoes or peppers)
   - » Or your direct seeding date (for crops like zinnias or spinach)
4. **Plan Your Indoor Seed Starting Date (for transplants only)** – If your crop needs to be started indoors, count back 5 to 8 weeks from your transplanting date. That's your seed starting day,when you'll sow seeds into trays or pots.
5. **Repeat for Each Crop** – Make a chart in your notebook or journal to track your plan for each crop. Include:
   - » Crop name
   - » Days to Maturity
   - » Seed starting date (if needed)
   - » Transplant or direct seed date
   - » Harvest date

Pro Tips

- Use color coding or sticky notes to track different crops on your calendar
- Avoid harvest dates during school breaks unless someone is available to tend the garden
- Keep notes in a garden journal so you can adjust for next season



PRODUCTION PLANNING IN PRACTICE: SAMPLE GREENHOUSE SCHEDULE

Use this sample timeline as a guide when planning crops for your greenhouse or school garden. This approach blends backward planning with planting and transplant dates to help align harvests with school events or cafeteria needs. Always adjust based on your local conditions, crop variety, and greenhouse setup.

CROP	SEED STARTING DATE	TRANSPLANT DATE	HARVEST DATE	NOTES
Lettuce	Sept. 10	—	Oct. 26	Direct seeded; cool-weather crop with fast growth
Tomatoes	Jan. 26	March 1	April 30	Needs staking; start indoors and transplant when soil warms
Bell Peppers	Sept. 6	Oct. 11	Dec. 10	Longer season; red peppers take more time than green ones
Radishes	Nov. 17	—	Dec. 10	Fast maturing (23 days); ideal for short greenhouse cycles
Peas	March 10	—	April 30	Direct seed early; use trellis for support
Salad Mix	Oct. 7	—	Dec. 10	Sow in succession every 7–10 days for a steady harvest
Zinnias	May 1 (optional)	June 1	August 18	Can be direct seeded or transplanted for earlier blooms
Cilantro	May 20	—	July 15	Direct seeded; avoid planting too early to prevent bolting

Tips for Success:

- Add 5–10 days to estimated days to maturity to account for slower germination in early spring or fall.
- Use sticky notes or color-coded markers in your garden calendar to track crop timelines.
- Keep a garden journal to record what worked, what didn't, and what to change for next season.

Left:
Bancroft-Rosalie students plant vegetables in their school garden.

SAMPLE ENTERPRISE BUDGET: VEGETABLE & FLOWER SALES PROJECT

Based on a one-time sales event (30 salad kits, 20 bouquets, 25 herb bunches)

CATEGORY	ITEM	ESTIMATED COST
Startup Costs	Garden tools (shared use)	$100 (initial investment)
	Labels, containers, twist ties	$25
	Floral sleeves for bouquets	$10
	Handwashing station & signage	$15
	TOTAL Startup	$150
Operating Costs	Seeds (lettuce, tomatoes, zinnias)	$30
	Soil amendments or compost	$20
	Water (if not school-supplied)	$10
	Misc. (gloves, harvest bags, etc.)	$15
	TOTAL Operating	$75
Estimated Income	30 Salad kits @ $7 each	$210
	20 Bouquets @ $6 each	$120
	25 Herb bunches @ $2 each	$50
	TOTAL Revenue	$380
Profit Estimate	Revenue – (Startup + Operating)	$380 – $225 = **$155**

Notes for Students:

- Profit could increase in future sales cycles since many startup costs are one-time expenses.
- Students can use this model to compare different pricing strategies, adjust product quantities, or factor in donations.
- Tracking time spent on production, harvest, and packaging can help determine the sustainability of future efforts.

CAREER PATHWAYS AND LEARNING CONNECTIONS

School gardens and greenhouse projects connect students to a wide range of careers in food systems, plant production, nutrition, and education. These experiences can lay the groundwork for future jobs or entrepreneurial projects, especially when tied to classroom subjects and hands-on learning.

Food and Plant Production Careers

Students interested in growing, harvesting, or managing plants may explore careers such as:

Greenhouse Manager
Oversees crop schedules, greenhouse systems, and seedling care

Urban Farmer
Grows food in city spaces using raised beds, high tunnels, or hydroponics

Florist or Event Designer
Uses cut flowers and herbs to create custom arrangements

Market Gardener
Operates a small, intensive farm that sells directly to customers or institutions

Health and Nutrition Careers

For students who care about wellness and food access, garden work can inspire careers like:

Farm to School Coordinator
Connects schools with local farmers and helps bring fresh food into cafeterias

Dietitian or Nutrition Educator
Teaches healthy eating and meal planning

Chef or Food Program Director
Designs menus and prepares meals using fresh, seasonal ingredients

Entrepreneurship and Education Careers

Creative and community-focused students may find their niche in:

CSA or Farmstand Coordinator
Organizes produce boxes or on-site sales

Youth Market Manager
Leads sales and marketing for a student-run market

Garden-Based Educator
Uses outdoor learning to teach across subjects

Right:
Banner County students plant seeds in their school greenhouse.

SUBJECT TIE-INS

- **Math** – Calculate Days to Maturity, plan rows and garden geometry
- **Science** – Conduct soil tests, explore photosynthesis, and study pest life cycles
- **Art** – Design flower arrangements, create signage or posters for events
- **Language Arts** – Keep garden journals, write plant care instructions or recipes
- **Business** – Build pricing models, create advertisements, and design marketing plans

Project-Based Learning Opportunities

- Host themed harvest events like taco or salad parties
- Run flower bouquet or herb bundle fundraisers
- Build nutrition bulletin boards with recipes and health facts
- Plant pollinator strips or create bee habitat gardens
- Design plant ID tags and educational signage for garden visitors

CLASSROOM INTEGRATION IDEAS

Connecting to Nebraska Harvest of the Month

The Nebraska Harvest of the Month (HOTM) program is a statewide Farm to School initiative that features different locally grown food products each month. It provides schools with resources to support sampling and serving local foods to students, as well as educational materials for classroom use.

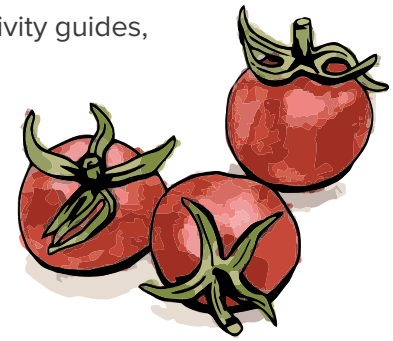
By aligning school garden projects with HOTM, educators can reinforce lessons on seasonality, nutrition, and local agriculture. For instance, planting and harvesting crops that coincide with HOTM selections can enhance student engagement and provide fresh produce for taste tests or cafeteria offerings.

Beginner-Friendly HOTM Crops for School Gardens:

- **Carrots** – Easy to grow and harvest; popular among students for their sweet taste.
- **Leafy Greens** – Such as lettuce and spinach; quick-growing and ideal for early spring or fall planting.
- **Radishes** – Fast-growing with a peppery flavor; great for teaching about root vegetables.
- **Cucumbers** – Prolific producers; can be used fresh or in pickling projects.
- **Tomatoes** – Versatile and widely enjoyed; suitable for various culinary applications.
- **Sweet Potatoes** – Require a longer growing season but offer a rewarding harvest.

Educators can access free HOTM materials, including calendars, recipes, and activity guides, to support these initiatives. These resources are available through the Nebraska Department of Education's website: education.ne.gov/ns/farm-to-school/harvest-of-the-month

Integrating HOTM into school gardening projects not only enriches the educational experience but also fosters a deeper connection between students and their local food systems.



SUSTAINABILITY AND LESSONS LEARNED

Key Lessons

- Fast-growing crops like radishes and salad greens are ideal for quick wins and early taste tests
- Flowers not only attract pollinators but also make produce displays more appealing
- Students are more engaged when they get to taste what they grow and share it with their community

Sustainability Strategies

- Implement composting and seed saving practices to reduce input costs
- Use succession planting to maintain a steady harvest of salad mix
- Establish pollinator strips alongside beds to support bees and butterflies
- Partner with local growers for early plant starts and greenhouse collaboration

RESOURCES AND SUPPORT

National Farm to School Network
Program models, policy guidance, and success stories
farmtoschool.org

Growing for Market
Crop planning tools and small-scale grower resources
growingformarket.com

Big Garden Omaha
Garden education and urban farming tools for schools
biggarden.org

Nebraska Master Gardeners
Volunteer support and technical guidance
mastergardener.unl.edu

Above:

East Butler students gain marketing and sales experience several times throughout the year by hosting plant sales in their school greenhouse and by participating in farmers markets.

LESSONS FROM FARMER MENTORS

WHAT THEY LEARNED - AND WHY THEY'D DO IT AGAIN

As part of this project, farmers and food producers partnered with schools to grow crops, host visits, and provide real-world learning experiences. Their reflections show how much impact these collaborations had - not just for students, but for the farmers themselves.

Real-World Impact for Students

"Getting them on a farm and seeing how things really work is so valuable and provides hands-on learning for students." – Farmer Mentor

"I sure enjoyed having the students come out to the farm. We had a lot of questions and engagement. They weren't afraid to ask!" – Farmer Mentor

"It was great to see how many of the class were truly interested and asking questions about growing mushrooms. They were engaged the whole time." – Farmer Mentor

Advice for Schools

"...my advice would be: ask a lot of questions and keep the dialogue open." – Farmer Mentor

"This was an excellent opportunity. We just needed more people to see it." – Farmer Mentor

Community Engagement

"... if we can reach parents through what the kids are doing, that's the key." – Farmer Mentor

"We could hold clinics hosted by the kids or invite media to school events." – Farmer Mentor

These farmer voices reinforce what the project set out to prove: when students connect with local growers, it plants a seed for lifelong learning, entrepreneurship, and stronger communities.

Right:
With the help of local farmers and community members, Oakland-Craig students learned about proper fencing techniques in order to contain livestock.

CONCLUSION & NEXT STEPS

GROW YOUR SKILLS. FEED YOUR COMMUNITY. FIND YOUR PATH.

Whether you're growing salad greens in a high tunnel, making jam with your family, or presenting a project at the fair - you're part of a much bigger story. Nebraska's specialty crop producers, farmers, makers, and educators are building a better food system - and you're already in it.

What's Next? Keep Growing.

If this project sparked something for you, a new idea, a future goal, or simply a love for growing things, here are ways to keep that momentum going.

Educational Programs and Student Opportunities

FFA
Build leadership skills and explore ag careers through SAEs, CDEs, and classroom projects.

ffa.org

4-H
Get hands-on with livestock, cooking, plant science, and business projects.

4h.unl.edu

Nebraska Extension
Connect with Master Gardeners, nutrition programs, and youth learning events.

extension.unl.edu

Local Community Colleges
Explore programs in ag, horticulture, culinary arts, and sustainability.

nebraskacommunitycolleges.org

Center for Rural Affairs (CFRA)
Workshops and mentorship for beginning farmers and young leaders.

www.cfra.org

Organizations That Can Help You Grow

Nebraska Winery & Grape Growers Association (NWGGA)
Explore the state's vineyard industry and participate in grower workshops.

nebraskawines.com

Nebraska Sustainable Agriculture Society (NSAS)
Attend farmer-led trainings and explore sustainable food systems work.

sustainablenebraska.org

Big Garden Omaha
Access garden kits, youth programming, and food justice learning opportunities.

biggarden.org

National Farm to School Network
Find inspiration, toolkits, and success stories from schools across the country.

farmtoschool.org

Nebraska Farm to School Program

Farm to School focuses on three core elements—Procurement, Education, and School Gardens—to support the use of Nebraska-grown products in classrooms, cafeterias, and communities.

education.ne.gov/ns/farm-to-school

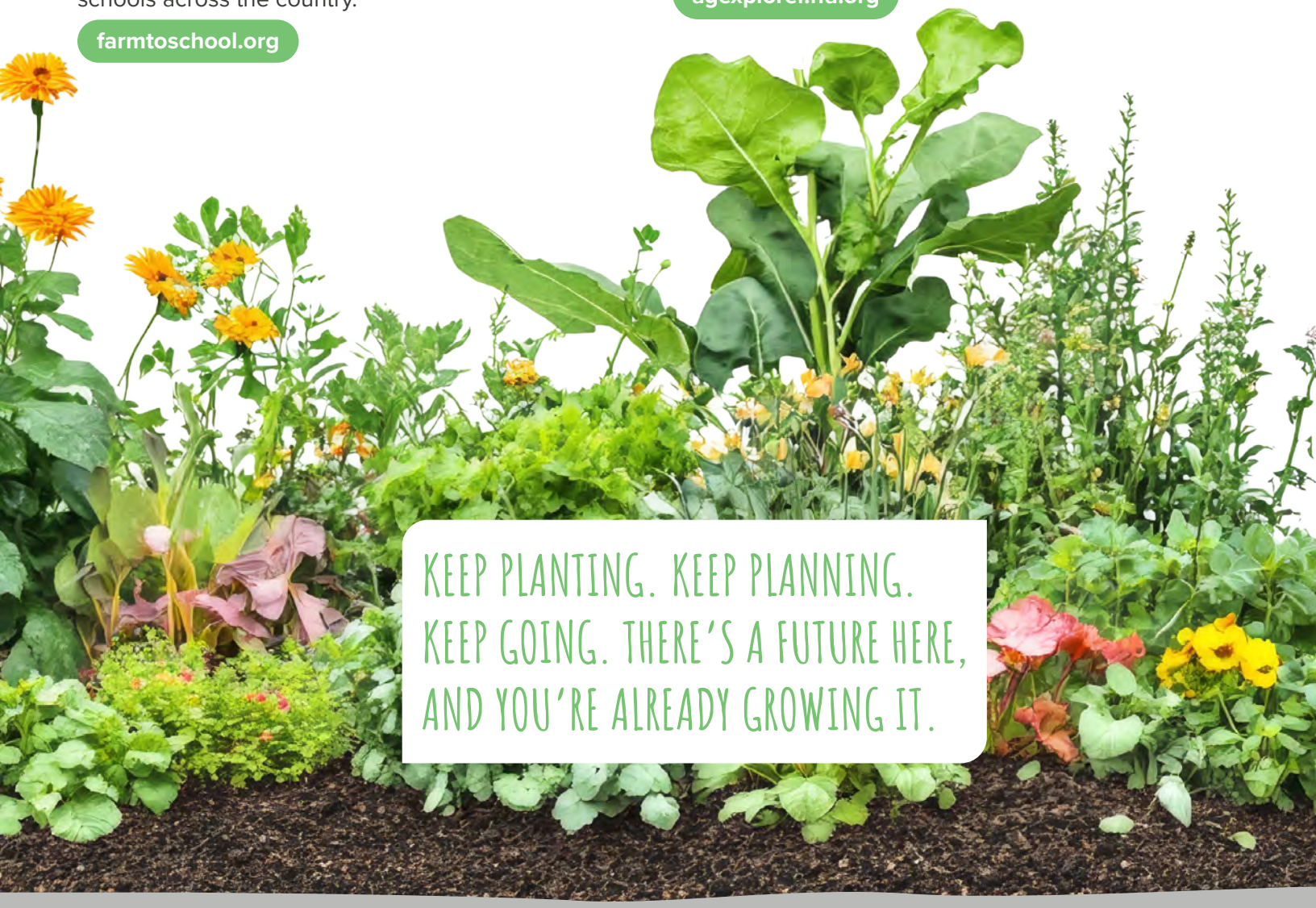
AgCareers.com
Explore real jobs in agriculture, food, the environment, and beyond.

agcareers.com

FFA AgExplorer

An interactive platform designed to help students and educators explore over 235 careers in agriculture through tools like the MyCareer Quiz, virtual field trips, and educator resources.

agexplorer.ffa.org



BLANK FORMS & PLANNING TOOLS

Whether students are growing salad greens in a raised bed, tracking mushrooms in a classroom kit, or planning flower harvests for a fundraiser, strong planning and reflection are key. This section includes practical, ready-to-use worksheets to help students take ownership of their projects, think like growers, and connect what they do in the field to what they learn in the classroom.

These tools support goal setting, planting schedules, budgeting, observations, and final reflections. They're meant to be flexible,useful for greenhouse managers, food system explorers, or future entrepreneurs.

Use them as-is or adapt them to fit your local context, school calendar, or project goals.

SPECIALTY CROP ENTERPRISE BUDGET WORKSHEET

Use this worksheet to plan your specialty crop project. You'll estimate your costs (what you'll spend), your revenue (what you might earn), and calculate whether you'll make a profit or need to adjust your plan.

Step 1: Estimate Your Costs

Startup Costs

(These are one-time expenses like tools, trays, or signs.)

ITEM	ESTIMATED COST
TOTAL STARTUP COSTS	

Operating Costs

(These are things you'll need each time you grow, like seeds or compost.)

ITEM	ESTIMATED COST
TOTAL OPERATING COSTS	

Step 2: Estimate Your Revenue

(What are you planning to sell or share? How many? At what price?)

PRODUCT	QUANTITY	PRICE EACH	TOTAL REVENUE
TOTAL REVENUE			

Step 3: Calculate Estimated Profit or Loss

Total Revenue – (Startup + Operating Costs) = Estimated Profit

Revenue: $ _____

Costs: $ _____

Estimated Profit or Loss: $ _____

CROP CALENDAR: BACKWARD PLANNING WORKSHEET

Use this worksheet to plan when to plant your seeds so your crops are ready to harvest at just the right time, for a market, school event, or end-of-year celebration.

How to Use This Worksheet

1. Choose your harvest date,when you want to pick your crop.
2. Look up the Days to Maturity (DTM) on the seed packet or in a seed catalog.
3. Count backward from the harvest date by the number of DTM days.
4. Subtract 5–7 days to allow for germination or transplant recovery.
5. Identify if the crop should be direct seeded (planted straight in the soil) or transplanted (started indoors and moved outside).
6. Fill in your planting or seed starting date.

Example:

You want tomatoes and zinnias ready for harvest by August 18.

Transplant Example – Tomato (Striped German)

- Harvest Date: August 18
- DTM: 78 days (from transplant to harvest)
- Transplant Date: June 1
- Seed Starting Date: April 10 (count back ~7 weeks)
- Method: Transplant

Direct Seed Example – Zinnia

- Harvest Date: August 18
- DTM: 60 days (from direct seed to bloom)
- Add 5 extra days for germination → Count back 65 days
- Direct Seed Date: June 14
- Method: Direct Seed

Crop Calendar Table

CROP NAME	HARVEST DATE	DAYS TO MATURITY	EXTRA DAYS (5–7)	DIRECT SEED OR TRANSPLANT	PLANTING OR STARTING DATE

HARVEST & DISTRIBUTION TRACKER

Use this form to keep track of what you harvested, where it went, and how it was used. This helps you stay organized, reflect on your production, and report outcomes at the end of your project.

Directions:

- Record what you picked and how much.
- Mark if it was sold, donated, or used at school (cafeteria, tasting, etc.).
- Add notes about price, packaging, student helpers, or special events.

Example:

Product: Zinnias
Quantity: 15 stems
Destination: Sold at farmstand
Notes: $3 per stem, sold by student marketing team

Harvest & Distribution Table

DATE	PRODUCT	QUANTITY	SOLD / DONATED / USED	NOTES (PRICE, HELPERS, PACKAGING, ETC.)

CROP OBSERVATION & TASK LOG

Use this page to track what you've done with your crop, what you've observed, and what should happen next. Fill out one row each time you visit your growing space or complete a garden task.

Directions:

- Write the date and crop name you're observing or working on.
- Check one or more boxes for the task you completed.
- Write a clear description of what you did (watering, thinning, staking, etc.).
- Record anything you noticed (growth, pests, weather, soil condition, etc.).
- Write a next step,what needs to happen on your next visit.

Use additional rows or pages for long-term or high-volume projects.

Observation & Task Log Table

DATE	CROP NAME	TASKS: WATER / WEED / HARVEST / PLANT / OTHER	WHAT I DID (BE SPECIFIC)	WHAT I NOTICED	NEXT STEP

DATE	CROP NAME	TASKS: WATER / WEED / HARVEST / PLANT / OTHER	WHAT I DID (BE SPECIFIC)	WHAT I NOTICED	NEXT STEP

DATE	CROP NAME	TASKS: WATER / WEED / HARVEST / PLANT / OTHER	WHAT I DID (BE SPECIFIC)	WHAT I NOTICED	NEXT STEP

STUDENT PROJECT REFLECTION

Use this reflection to think about what you learned, what went well, what could be improved, and how this project connects to your goals.

Directions:

1. Answer each prompt with a few sentences.
2. Use examples from your actual experience.
3. This isn't about getting the "right" answer - it's about being thoughtful and honest.

Name: _____ Date: _____

Crop or Project Focus: _____

1. What did you learn that you didn't expect?

(Think about skills, facts, or challenges you didn't see coming.)

_____

_____

2. What part of the project did you enjoy the most, and why?

(Be specific - was it hands-on work, teamwork, harvesting, etc.?)

_____

_____

3. Describe one challenge you faced. How did you handle it?

(This could be weather, pests, teamwork, timing, or anything else.)

_____

_____

4. If you were in charge next time, what would you do differently?

_____

_____

5. How does this project connect to things you're interested in or want to learn more about?

(This could relate to careers, science, leadership, or life skills.)

_____

_____