Hydroponic Vine Crop Training Series: Harvest Strategy & System Maintenance

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SUPPORTED BY: THE CHUGACH REGIONAL RESOURCE COMMISSION AND THE ADMINISTRATION FOR NATIVE AMERICANS

Presentation Overview

- **Harvesting Strategies:**
  Practical approaches for timed harvesting, including succession planting and selective harvesting.

- **Crop Longevity Planning:**
  Developing harvest schedules, nutrient dosing, and pruning strategies to extend plant productivity and lifespan

- **System Maintenance:**
  Fundamentals of cleaning and troubleshooting to extend equipment life and maintain optimal growing conditions.

Harvesting Strategies

Harvest timing and production rates depend on crop type, environmental conditions, and overall system management. The goal is to create a consistent harvest over time by balancing planting schedules, plant health, and production demand.

Full-System Planting (Single System)

- Plant the entire system at once
- Simplest approach to manage
- Harvest occurs within a shorter, concentrated window

Staggered Planting (Multiple Systems or Sections)

- Spread plantings over time for continuous production
- Helps balance workload and maintain steady supply

Small Scale (4–8 buckets)

- 2–4 staggered planting groups

Large Scale (multiple systems)

- Monthly or biweekly planting cycles

Production Tracking & Efficiency

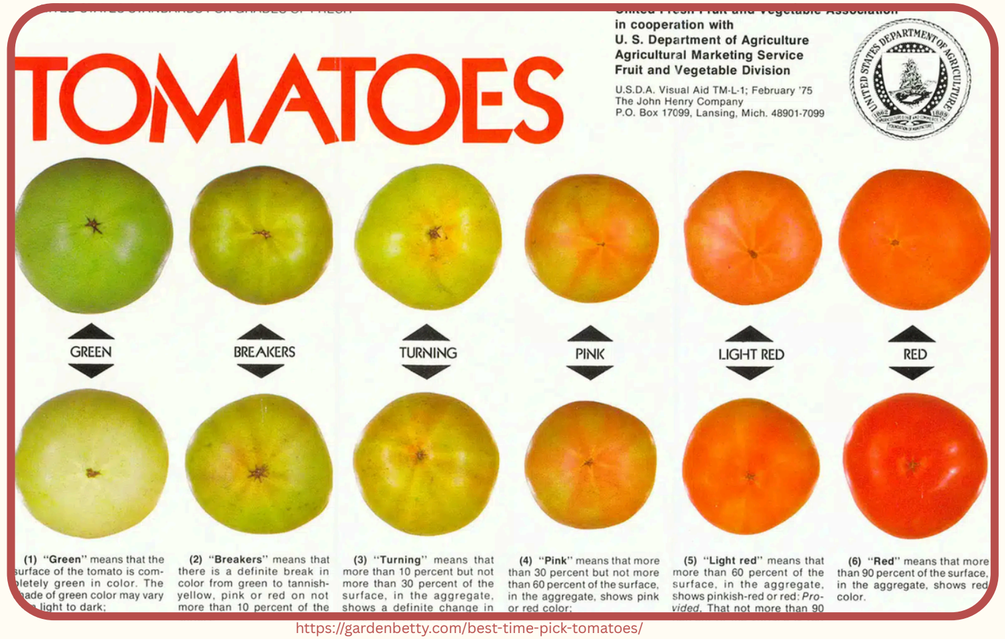
- Track harvest quantity and harvest intervals over time
- Use production data to improve scheduling and system efficiency
- Consistent environmental conditions help stabilize production rates

Tip:

Start seedlings ahead of time and keep plants organized and properly supported throughout production.

Tomato Harvesting

- Harvest at the desired ripeness stage (Breaker stage for transport/storage or full color for local sales or direct consumption.
- Remove cracked, damaged, or overripe fruit promptly
- Harvest fruit gently to avoid bruising or cracking (Cut or twist fruit carefully from the vine depending on variety, harvest at the “Knuckle”)



https://gardenbetty.com/best-time-pick-tomatoes/

Determinate vs. Indeterminate Tomatoes

Determinate varieties

- Produce fruit over a shorter, concentrated period
- Typically require less pruning and support
- Often harvested in larger flushes

Indeterminate varieties

- Continue growing and producing over long periods
- Require ongoing harvesting, pruning, and support
- Often use lowering and leaning techniques as plants mature

Production Estimates:

TOV tomatoes: ~25 lbs per plant over 25 weeks (~1 lb/week)

Cherry tomatoes: ~7 lbs per plant over 25 weeks (~0.28 lb/week)

Tip:

Cherry tomatoes often require more frequent harvesting during peak production.

Cucumber Harvesting

- Harvest cucumbers early and consistently for best quality
- Fruit size and harvest timing vary by variety and market preference
- Oversized fruit can slow new fruit production and reduce plant energy
- Check plants frequently during peak production (Some varieties may require daily harvesting)
- Cut fruit cleanly from the vine using scissors or pruners (Avoid pulling or twisting fruit from the plant)

Parthenocarpic vs. Pollinated Varieties

Parthenocarpic varieties

- Produce fruit without pollination
- Commonly used in hydroponic systems
- Typically produce more uniform fruit

Pollinated varieties

- Require pollination for full fruit development
- Poor pollination can result in misshapen fruit

Production Estimates

~11 lbs per plant over 6 weeks (~1.8 lbs/week)

Tip:

Missing harvests during peak production can quickly reduce cucumber quality and yield.

Pepper Harvesting

- Peppers can be harvested green or fully ripened depending on production goals
- Green peppers allow for faster harvest cycles and increased production rates
- Fully colored peppers require more time and plant energy to mature
- Use scissors or pruners to harvest peppers cleanly from the plant
  - Pulling fruit can damage branches or remove flowers
- Remove damaged or overripe fruit

Harvest Timing & Production Goals

Green harvest

- Faster turnover and more harvest cycles

Colored harvest

- Longer production time but often higher market value

Production Estimates

Jalapeños: ~3.5 lbs per plant over 15 weeks (~0.23 lbs/week)

Pepper Variety Considerations

- Smaller pepper varieties often produce and ripen more quickly
- Larger fruiting peppers generally require longer harvest intervals

Tip:

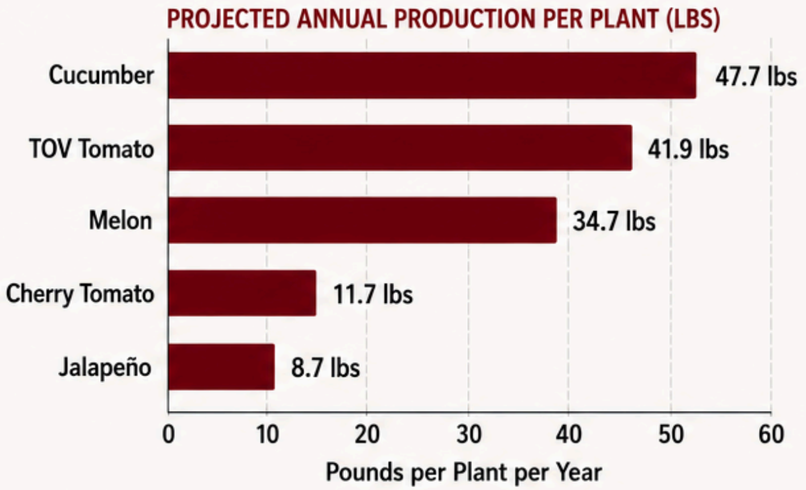
Consistent harvesting helps maintain flowering and overall plant productivity.

Data Collection & Market Research

PROJECTED ANNUAL PRODUCTION & KODIAK RETAIL VALUE ESTIMATES

Planning estimates based on University of Arizona greenhouse trial harvest data.

Annual production depends on harvest duration, crop turnover, transplant timing, environmental conditions, and system management.



Projected annual production estimates are based on University of Arizona greenhouse trial harvest data with a 6-week cleaning, transplanting, and establishment buffer included between crop cycles.

Assumes established transplants are propagated separately before entering production systems. Actual production varies by variety, environment, harvest strategy, and system design.

EXAMPLE KODIAK RETAIL VALUE ESTIMATES

Safeway Online Pricing – 2026

CROP TYPE	VARIETIES	KODIAK PRODUCT PRICE RANGE (per lb unless noted)	POTENTIAL ANNUAL PRODUCT VALUE / PLANT*
TOMATOES 	Roma Tomatoes TOV (On the Vine) Tomatoes Organic On the Vine Tomatoes Cherry Tomatoes	$4.99 – $7.99	$209 – $335 (based on 41.9 lbs)
PEPPERS 	Green Bell Peppers Colored Bell Peppers Mini Sweet Peppers Organic Mini Sweet Peppers	$2.49 – $5.99	$22 – $52 (based on 8.7 lbs)
CUCUMBERS 	Standard Cucumbers English Cucumbers Organic English Cucumbers Mini Cucumbers Japanese Cucumbers	$1.49 – $6.99	$71 – $333 (based on 47.7 lbs)
MELONS 	Cantaloupe Watermelon Mini Watermelon Fresh-Cut Melon (24 oz)	$2.00 – $5.99	$69 – $208 (based on 34.7 lbs)

**Potential annual product value estimates are based on projected annual production per plant and Kodiak Safeway online retail pricing (2026). Actual market value varies based on variety, quality, seasonality, sales outlet, and production conditions.*

KEY TAKEAWAYS

- Harvest strategy and crop turnover significantly impact annual production potential.
- Specialty varieties and locally grown greenhouse crops can receive premium pricing in Alaska markets.
- Crop value can change based on harvest timing, quality, packaging, and variety.
- Separate propagation systems can reduce downtime and support continuous production cycles.

Record your harvest data and variety types!

<u>This Can Impact:</u>

What varieties you grow

Financial Return

System Management & Optimization

Pepper Plants

Maintaining Systems During Production

Hydroponic vine crop systems can produce continuously with routine maintenance between harvests and periodic full-system cleanouts at the end of crop cycles. *(A benefit of seperating growth cycles by system)*

Continuous Growing Guidelines

- Nutrient Solution Management
  - Refresh nutrient reservoirs on a regular schedule (ex. every 4-6 weeks for smaller systems and every 10–12 weeks for larger systems)

- Full System Cleaning & Replanting
  - Cleaning and replanting time varies by system size (1/2 day for small systems and up to several days or a full week for larger systems)

Tip: Don’t forget to start your seedlings early, vine crops typically need 1–2 months before transplanting.

Crop Longevity Planning

To keep vine crops producing over long periods, build a consistent schedule around these three key practices:

Timed Harvests

- Harvest regularly (often weekly) and remove ripe fruit promptly. This encourages continued production and prevents energy loss along with overripe fruit.

Nutrient Management

- Maintain balanced conditions (pH, EC, and overall system health). Consistent nutrient levels support steady growth and fruit production

Pruning

- Prune weekly from the base upward to guide plant growth (or . This improves even energy distribution, airflow, and overall plant health.

Companion Planting

Companion planting depends on your system design, crop goals, and ability to manage different plant needs. In most cases, growing one crop per system is the simplest and most reliable approach. Crops with different nutrient needs (EC), growth rates, and training requirements are often easier to manage in separate systems.

Possible to Grow Together (With Care)

- Tomatoes
- Peppers
- Cucumbers

**Keep EC lower if growing peppers and tomatoes together (closer to EC of 2 vs EC of 2.5)*

Best Grown in Their Own System

- Melons
- Squash
- Zucchini

These crops grow aggressively, require more space and support, and are harder to manage alongside other plants.

Vine Crop Systems Overview

Light Cycles

- **16 hrs ON / 8 hrs OFF** - *recommended for most varieties*

Air Circulation

- Use adjustable airflow (both speed and position)
- Target ~1 ft/sec airflow (mild to medium)

Water Circulation

- Place pump on the far side of the reservoir (away from inflow, if possible)
- Air pumps and stones are optional
- Use an *Aeromixer* for improved mixing and circulation (set on a timer)

Temperature

- **Air:** Target ~70°F (avoid exceeding 80°F)
- **Water:** Keep below 75°F

After Removing plant material from grow container, discard or sterilize grow media. (let roots and leca stones dry out to make seperatinon and cleaning easier)

System Cleaning (DWC, Dutch Bucket, Ebb & Flow)

Turn off and drain the system

- Shut off pumps, air pumps, lights, and fans

Cut plants at the base and remove plant material

- Remove roots and grow media
- Compost plant-based material when possible
- Clean and reuse media like clay pebbles (LECA) if applicable

Clean system components

- Buckets, lids, lines, and reservoir
- Move to a cleaning area or clean in place

Run a cleaning/sanitizing solution

- Vinegar, hydrogen peroxide, Zerotol or diluted bleach
- Let the system run for 1–24 hours (Clean during this time)

Drain, rinse, and refill

- Rinse thoroughly (multiple rinses may be needed, especially with bleach)
- Refill with clean water and nutrients

Air stones & lines (DWC systems)

- Sanitize and rinse before reuse
- Replace if clogged or worn

Backup Equipment

Core System Components

- 1–2 spare pumps
- 1–2 spare fans
- Grow light or replacement parts (if possible)

Plumbing & Hardware

- Emitters, tubing, fittings, extra buckets
- PVC cement & food-grade/aquarium-safe silicone
- Spare valves, clamps, and connectors

Air & Water Components (DWC)

- Air stones and extra airline tubing
- Backup air pump

Monitoring & Control

- Extra timers
- pH/EC meter (or backup probes if applicable)

Consumables & Supplies

- Seeds, grow media, nutrients
- Gloves, bags, labels, cleaning supplies, etc.

**Keep track of what you use and how much!*

System Maintenance & Common Issues

Pump runs dry and burns out

- Keep nutrient reservoirs filled
- Have a backup pump available

Emitters not placed correctly → leaks

- Adjust emitter flow and secure placement in grow media
- Trim emitter length if needed
- Check drain tubes are positioned correctly

Emitters clog with debris or algae

- Use wire or a pipe cleaner to unclog
- Check and clean during regular maintenance

Root overgrowth clogs drainage and causes overflow

- Use felt liner pots to help contain roots inside buckets

Timer switched from “Timer” to “Outlet On” (this can leave lights on 24/7)

- Double-check timer settings and light cycle

Troubleshooting Guide: Water flow

Pump is on, but there's low or no water flow?

Check flow settings

- Adjust water flow dial on pump or controller
- Make sure pump is properly connected to the controller (unplug and restart if needed)

Check for clogs

- Emitters may be clogged, use a small wire or pipe cleaner to clear
- Inspect pump intake for roots, leaves, or buildup (use pump bag)

Check water level

- Low reservoir levels can cause air locking (bubbling sound)

Check connections

- Ensure tubing is securely connected to the pump
- Loose fittings can reduce pressure and flow

Check power supply

- Confirm outlet, timer, and controller are functioning properly. Unplug and reset.

Still having issues?

It may be time to replace the pump. (Always check warranty and contact vendor as needed)

DWC Note:

If airflow is low, check airlines and air stones for buildup. If clear, replace the air pump

Troubleshooting Guide: Lights & Fans

If lights aren't working:

Check timer & power

- Look for loose connections
- Confirm light cycle is set correctly
- Switch to "Outlet On" to test power (remember to switch back to "Timer On")

Check light connections

- Inspect plugs and fixture connections

Still not working?

- Replace light controller box before lights
- Light fixture may need replacement (water damage or burnout)

If fans (or one fan) aren't working:

Check power source

- Inspect power strip and connections

Check fan settings & connections

- Ensure speed dial is set correctly
- Look for loose wiring

Check for dust buildup

- Clean fan blades and screens (restricted airflow can slow fans over time)

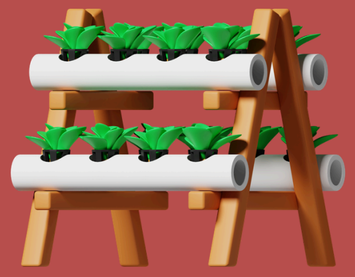
Still not working?

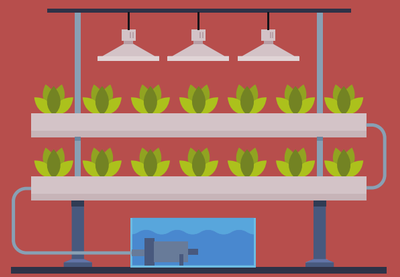
- Fan may need replacement (burnout or water damage)

Tip: Always check power, connections, and buildup first, these cause most issues.

Presentation Summary

- **Harvest Strategy & Planning:** Harvest timing depends on crop type, growth conditions, and planting strategy. Full-system or staggered planting approaches can help balance workload, production, and market demand over time.
- **Crop-Specific Harvesting Practices:** Tomatoes, cucumbers, and peppers all have different harvest timing, production patterns, and harvesting methods. Understanding these differences helps improve fruit quality, plant productivity, and overall yield.
- **Selective Harvesting & Crop Longevity:** Regular harvesting, balanced nutrients, and pruning help maintain continuous production over longer growing periods. Consistent routines support plant health and overall system performance.
- **Companion Planting & System Design:** Crop compatibility depends on system size, layout, and management style. Simpler systems with similar crop needs are often easier to maintain and troubleshoot.
- **System Setup & Environmental Control:** Lighting, airflow, water movement, and temperature all influence plant health, growth rates, and long-term production. Stable conditions help maintain consistent harvests and reduce system issues.
- **System Maintenance, Cleaning & Troubleshooting:** Routine cleaning, monitoring, and troubleshooting help prevent buildup, clogs, and equipment failure. Most issues relate to water flow, power, or overall system maintenance.
- **System Reliability & Backup Planning:** Keeping backup equipment and essential supplies on hand reduces downtime and maintains production. Simple, well-maintained systems are easier to manage and more resilient over time.





Quyanaa - Thank you!

Sources

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www.Kodiakleadershipinstitute.org