YOUR FREE READER'S COMPANION

The Greenhouse Build Pack

A companion to The Backyard Greenhouse Building Bible · by Dell Hawkins

Thanks for picking up the book. This is the companion you keep on the bench while you plan and build: how to site the greenhouse for real winter light, how the glazing options actually compare, how to size ventilation so you do not cook your plants in April, and a build checklist you can work straight down. Print it, clip it to the plans, and keep it where the tape measure is.

Three decisions make or break a backyard greenhouse before you ever cut a stud: where you put it, what you glaze it with, and how you vent it. Get siting, glazing, and airflow right and the growing takes care of itself. Get them wrong and no amount of good framing saves the season. — Dell

Siting and Orientation

A greenhouse is a light-collecting machine. Everything else is secondary to putting it where the light is, especially the low winter sun.

- Aim for the winter sun. In the northern hemisphere the long axis (the ridge) generally runs east to west for a season-extending greenhouse, so the long south-facing wall soaks up the low winter sun. For a summer-only greenhouse orientation matters far less.
- Watch the shadows in winter, not summer. A tree line or a house that clears the sun in July can bury your site in shade in December, when the sun sits low. Check the site at midday in the coldest months, or map the shadows before you commit.
- Drainage first. Never set a greenhouse in the low spot where water collects. Standing water rots sills, heaves foundations, and breeds disease. Pick high ground or build the pad up.
- Shelter from the worst wind, not all of it. A windbreak on the cold side cuts heat loss, but leave room for airflow and for the door to swing.

Goal	Ridge orientation	Why
Year-round / winter growing	East-West (long wall faces south)	Captures low winter sun on the big face
Spring-to-fall growing	North-South	More even light through the day, less summer overheating

Glazing: How the Options Really Compare

Glazing is the single biggest cost and comfort decision. There is no best one, only the right one for your climate, budget, and how long you want it to last.

Glazing	Light transmission	Insulation (approx R)	Lifespan	Notes
Single polyethylene film	High (~90%)	~R-0.85	1-4 yr (UV rated)	Cheapest; double-layer with a small blower for ~R-1.5
Twin-wall polycarbonate	Good (~80%)	~R-1.6 (twin) to R-2.5 (triple)	10-15 yr	Best all-around for most backyard builds; diffuses light
Glass (single)	Highest (~90%)	~R-0.9	Decades	Classic look, heavy, breakable, poor insulator alone
Glass (double / IGU)	High (~80%)	~R-2	Decades	Best insulation and clarity; heaviest and priciest

Rules of thumb:

- For most people in a cold climate, twin-wall polycarbonate wins: it insulates far better than glass or

single film, resists hail, and diffuses light so plants do not scorch.

- Double up film with an inflation blower to trap an air layer; it nearly doubles the R-value for a few dollars of fan.
- Match your framing to the weight. Glass needs a stout frame and a real foundation. Film and polycarbonate ride on a lighter frame.

Ventilation: Size It or Cook It

More backyard crops die from overheating in spring than from cold in winter. A closed greenhouse on a sunny 55-degree day can hit 100 degrees inside in an hour. You have two ways to vent, and most good greenhouses use both.

Passive (vents). Cheap, silent, no power. Rule of thumb: total vent area (roof plus side vents) should be about 15 to 20 percent of the floor area, split between low intake vents and high (ridge) exhaust vents so heat chimneys out the top while cool air is drawn in low.

- Roof or ridge vents do most of the work; hot air rises and leaves.
- Add low side vents or louvers for intake. High-out, low-in is the whole trick.
- Automatic wax-cylinder vent openers cost little and open the vents for you when it heats up. Worth every penny; they save the crop the day you are not home.

Active (exhaust fan). For tight or hot-climate greenhouses. Size the fan to move roughly one full air change per minute: fan capacity in cubic feet per minute is about equal to the greenhouse volume (length x width x average height) in cubic feet.

Greenhouse size	Approx volume	Target exhaust fan
8 x 8 (avg 7 ft high)	~450 cu ft	~450-500 CFM
8 x 12 (avg 7.5 ft)	~720 cu ft	~700-800 CFM
10 x 16 (avg 8 ft)	~1,280 cu ft	~1,300-1,500 CFM

Put the fan high on one end and a shuttered intake low on the far end so the pull crosses the whole house. A thermostat on the fan makes it automatic.

Foundation and Anchoring

A greenhouse is a big light sail. Wind is the enemy, so the base has to hold it down as much as hold it up.

- Ground-anchor kits or helical anchors work for light film and polycarbonate hoop or lean-to houses. Anchor every corner and at intervals along the base.
- A gravel pad with a pressure-treated perimeter timber drains well and gives a solid, level base for most backyard framed greenhouses. Stake or anchor the timber down.
- A perimeter footing or slab is for glass houses and permanent builds; overkill for a film house, essential for glass.
- Whatever you choose, get it dead level first. A greenhouse that is out of level fights you on doors, vents, and glazing every day it stands.

Build Checklist

Work down the list. Do not glaze until the frame is square, plumb, and anchored.

- [ ] Site chosen for winter light and good drainage; winter shadows checked
- [ ] Ridge orientation decided (E-W for winter growing, N-S for spring-to-fall)
- [ ] Called 811 for utility locates before digging
- [ ] Base built dead level (gravel pad, perimeter timber, or footing)
- [ ] Frame anchored against wind at every corner and along the base
- [ ] Frame checked square (equal diagonals) and posts plumb
- [ ] Glazing chosen to match climate, budget, and frame strength
- [ ] Vents sized to 15-20% of floor area, high-out and low-in
- [ ] Automatic vent openers or a thermostat-controlled exhaust fan installed
- [ ] Door swings clear and latches; weatherstrip for winter
- [ ] A max-min thermometer hung at plant height to watch the real swings

Build it level, anchor it hard, glaze it for your climate, and vent it more than you think you need to. Do that and the greenhouse will pay you back every season. — Dell